EPA KEY CONTACTS FORM

OMB Number: 2030-0020
Expiration Date: 06/30/2024

Authorized Representative: *Original awards and amendments will be sent to this individual for review and acceptance, unless otherwise indicated.*

Name: Prefix: Mr. First Name: Thomas Middle Name: J.
Last Name: French Suffix:
Title: Director, Operational Services Administraton
Complete Address:
Street1: 1800 Washington Boulevard
Street2:
City: Baltimore State: MD: Maryland
Zip / Postal Code: 21230-1701 Country: USA: UNITED STATES
Phone Number: 410-537-3138 **Fax Number:**
E-mail Address: tom.french@maryland.gov

Payee: *Individual authorized to accept payments.*

Name: Prefix: Mr. First Name: Paul Middle Name:
Last Name: Koenig Suffix:
Title: Deputy Director, Fiscal Services
Complete Address:
Street1: 1800 Washington Boulevard
Street2:
City: Baltimore State: MD: Maryland
Zip / Postal Code: 21230-1701 Country: USA: UNITED STATES
Phone Number: 410-537-4404 **Fax Number:**
E-mail Address: paul.koenig@maryland.gov

Administrative Contact: *Individual from Sponsored Programs Office to contact concerning administrative matters (i.e., indirect cost rate computation, rebudgeting requests etc).*

Name: Prefix: Mrs. First Name: Shawne Middle Name:
Last Name: Stephens-Drake Suffix:
Title: Program Manager, ARA Admin Service/Operations
Complete Address:
Street1: 1800 Washington Boulevard
Street2:
City: Baltimore State: MD: Maryland
Zip / Postal Code: 21230-1701 Country: USA: UNITED STATES
Phone Number: 410-537-3250 **Fax Number:**
E-mail Address: shawne.stephens-drake1@maryland.gov

EPA Form 5700-54 (Rev 4-02)

EPA KEY CONTACTS FORM

Project Manager: *Individual responsible for the technical completion of the proposed work.*

Name: Prefix: Mr. First Name: George Middle Name:
Last Name: Auburn Suffix: Jr.

Title: Director, Air and Radiation Administration

Complete Address:

Street1: 1800 Washington Boulevard
Street2:
City: Baltimore State: MD: Maryland
Zip / Postal Code: 21230-1701 Country: USA: UNITED STATES

Phone Number: 410-537-3255 **Fax Number:**

E-mail Address: george.auburn@maryland.gov

OMB Number: 2030-0020
Expiration Date: 06/30/2024

Preaward Compliance Review Report for All Applicants and Recipients Requesting EPA Financial Assistance

Note: Read Instructions before completing form.

I. A. Applicant/Recipient (Name, Address, City, State, Zip Code)

Name: Maryland Department of the Environment

Address: 1800 Washington Boulevard

City: Baltimore

State: MD: Maryland Zip Code: 21230-1701

B. DUNS No. 1696400620000

II. Is the applicant currently receiving EPA Assistance? ☒ Yes ☐ No

III. List all civil rights lawsuits and administrative complaints pending against the applicant/recipient that allege discrimination based on race, color, national origin, sex, age, or disability. (Do not include employment complaints not covered by 40 C.F.R. Parts 5 and 7.)

None

IV. List all civil rights lawsuits and administrative complaints decided against the applicant/recipient within the last year that allege discrimination based on race, color, national origin, sex, age, or disability and enclose a copy of all decisions. Please describe all corrective actions taken. (Do not include employment complaints not covered by 40 C.F.R. Parts 5 and 7.)

None

V. List all civil rights compliance reviews of the applicant/recipient conducted by any agency within the last two years and enclose a copy of the review and any decisions, orders, or agreements based on the review. Please describe any corrective action taken. (40 C.F.R. § 7.80(c)(3))

N/A

VI. Is the applicant requesting EPA assistance for new construction? If no, proceed to VII; if yes, answer (a) and/or (b) below.

☐ Yes ☒ No

a. If the grant is for new construction, will all new facilities or alterations to existing facilities be designed and constructed to be readily accessible to and usable by persons with disabilities? If yes, proceed to VII; if no, proceed to VI(b).

☐ Yes ☒ No

b. If the grant is for new construction and the new facilities or alterations to existing facilities will not be readily accessible to and usable by persons with disabilities, explain how a regulatory exception (40 C.F.R. 7.70) applies.

VII. Does the applicant/recipient provide initial and continuing notice that it does not discriminate on the basis of race, color, national origin, sex, age, or disability in its program or activities? (40 C.F.R 5.140 and 7.95)	☒ Yes	☐ No
a. Do the methods of notice accommodate those with impaired vision or hearing?	☒ Yes	☐ No
b. Is the notice posted in a prominent place in the applicant's offices or facilities or, for education programs and activities, in appropriate periodicals and other written communications?	☒ Yes	☐ No
c. Does the notice identify a designated civil rights coordinator?	☒ Yes	☐ No
VIII. Does the applicant/recipient maintain demographic data on the race, color, national origin, sex, age, or handicap of the population it serves? (40 C.F.R. 7.85(a))	☒ Yes	☐ No
IX. Does the applicant/recipient have a policy/procedure for providing access to services for persons with limited English proficiency? (40 C.F.R. Part 7, E.O. 13166)	☒ Yes	☐ No

X. If the applicant is an education program or activity, or has 15 or more employees, has it designated an employee to coordinate its compliance with 40 C.F.R. Parts 5 and 7? Provide the name, title, position, mailing address, e-mail address, fax number, and telephone number of the designated coordinator.

Elaine McNeil, 1800 Washington Boulevard, MD 21230, Office: 410-537-3152 Fax: 410-537-3888. Elaine.mcneil@maryland.gov

XI. If the applicant is an education program or activity, or has 15 or more employees, has it adopted grievance procedures that assure the prompt and fair resolution of complaints that allege a violation of 40 C.F.R. Parts 5 and 7? Provide a legal citation or Internet Address for, or a copy of, the procedures.

Title V Sub 2 State Personnel & Pension Act of the Annotated Code of Maryland

For the Applicant/Recipient

I certify that the statements I have made on this form and all attachments thereto are true, accurate and complete. I acknowledge that any knowingly false or misleading statement may be punishable by fine or imprisonment or both under applicable law. I assure that I will fully comply with all applicable civil rights statutes and EPA regulations.

A. Signature of Authorized Official	B. Title of Authorized Official	C. Date
Thomas J French	Director, Operational Services Administration	03/24/2022

For the U.S. Environmental Protection Agency

I have reviewed the information provided by the applicant/recipient and hereby certify that the applicant/recipient has submitted all preaward compliance information required by 40 C.F.R. Parts 5 and 7; that based on the information submitted, this application satisfies the preaward provisions of 40 C.F.R. Parts 5 and 7; and that the applicant has given assurance that it will fully comply with all applicable civil rights statures and EPA regulations.

A. *Signature of Authorized EPA Official	B. Title of Authorized Official	C. Date

*** See Instructions**

Instructions for EPA FORM 4700-4 (Rev. 06/2014)

General. Recipients of Federal financial assistance from the U.S. Environmental Protection Agency must comply with the following statutes and regulations.
Title VI of the Civil Rights Acts of 1964 provides that no person in the United States shall, on the grounds of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance. The Act goes on to explain that the statute shall not be construed to authorize action with respect to any employment practice of any employer, employment agency, or labor organization (except where the primary objective of the Federal financial assistance is to provide employment). Section 13 of the 1972 Amendments to the Federal Water Pollution Control Act provides that no person in the United States shall on the ground of sex, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under the Federal Water Pollution Control Act, as amended. Employment discrimination on the basis of sex is prohibited in all such programs or activities. Section 504 of the Rehabilitation Act of 1973 provides that no otherwise qualified individual with a disability in the United States shall solely by reason of disability be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance. Employment discrimination on the basis of disability is prohibited in all such programs or activities. The Age Discrimination Act of 1975 provides that no person on the basis of age shall be excluded from participation under any program or activity receiving Federal financial assistance. Employment discrimination is not covered. Age discrimination in employment is prohibited by the Age Discrimination in Employment Act administered by the Equal Employment Opportunity Commission. Title IX of the Education Amendments of 1972 provides that no person in the United States on the basis of sex shall be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any education program or activity receiving Federal financial assistance. Employment discrimination on the basis of sex is prohibited in all such education programs or activities. Note: an education program or activity is not limited to only those conducted by a formal institution. 40 C.F.R. Part 5 implements Title IX of the Education Amendments of 1972. 40 C.F.R. Part 7 implements Title VI of the Civil Rights Act of 1964, Section 13 of the 1972 Amendments to the Federal Water Pollution Control Act, and Section 504 of The Rehabilitation Act of 1973. The Executive Order 13166 (E.O. 13166) entitled; "Improving Access to Services for Persons with Limited English Proficiency" requires Federal agencies work to ensure that recipients of Federal financial assistance provide meaningful access to their LEP applicants and beneficiaries.

Items "Applicant" means any entity that files an application or unsolicited proposal or otherwise requests EPA assistance. 40 C.F.R. §§ 5.105, 7.25. "Recipient" means any entity, other than applicant, which will actually receive EPA assistance. 40 C.F.R. §§ 5.105, 7.25. "Civil rights lawsuits and administrative complaints" means any lawsuit or administrative complaint alleging discrimination on the basis of race, color, national origin, sex, age, or disability pending or decided against the applicant and/or entity which actually benefits from the grant, but excluding employment complaints not covered by 40 C.F.R. Parts 5 and 7. For example, if a city is the named applicant but the grant will actually benefit the Department of Sewage, civil rights lawsuits involving both the city and the Department of Sewage should be listed. "Civil rights compliance review" means any review assessing the applicant's and/or recipient's compliance with laws prohibiting discrimination on the basis of race, color, national origin, sex, age, or disability. Submit this form with the original and required copies of applications, requests for extensions, requests for increase of funds, etc. Updates of information are all that are required after the initial application submission. If any item is not relevant to the project for which assistance is requested, write "NA" for "Not Applicable." In the event applicant is uncertain about how to answer any questions, EPA program officials should be contacted for clarification. * Note: Signature appears in the Approval Section of the EPA Comprehensive Administrative Review For Grants/Cooperative Agreements & Continuation/Supplemental Awards form.

Other Attachment File(s)

*** Mandatory Other Attachment Filename:** 1234-Attachment1_QualityAssuranceStatement.pdf

Add Mandatory Other Attachment | Delete Mandatory Other Attachment | View Mandatory Other Attachment

To add more "Other Attachment" attachments, please use the attachment buttons below.

Add Optional Other Attachment | Delete Optional Other Attachment | View Optional Other Attachment

Project Narrative File(s)

*** Mandatory Project Narrative File Filename:** 1240-Narrative_EJAirMonARPGrant_16mar22_FINAL2.pdf

Add Mandatory Project Narrative File | Delete Mandatory Project Narrative File | View Mandatory Project Narrative File

To add more Project Narrative File attachments, please use the attachment buttons below.

Add Optional Project Narrative File | Delete Optional Project Narrative File | View Optional Project Narrative File

OMB Number: 4040-0004
Expiration Date: 12/31/2022

Application for Federal Assistance SF-424

* 1. Type of Submission:
- [ ] Preapplication
- [x] Application
- [ ] Changed/Corrected Application

* 2. Type of Application:
- [x] New
- [ ] Continuation
- [ ] Revision

* If Revision, select appropriate letter(s):

* Other (Specify):

* 3. Date Received: 03/24/2022

4. Applicant Identifier:

5a. Federal Entity Identifier:

5b. Federal Award Identifier:

State Use Only:

6. Date Received by State:

7. State Application Identifier:

8. APPLICANT INFORMATION:

* a. Legal Name: State of Maryland, Maryland Department of the Environment

* b. Employer/Taxpayer Identification Number (EIN/TIN): S734YDNLSHW5

* c. Organizational DUNS: 1696400620000

d. Address:

* Street1: 1800 Washington Boulevard
Street2:
* City: Baltimore
County/Parish:
* State: MD: Maryland
Province:
* Country: USA: UNITED STATES
* Zip / Postal Code: 21230-1701

e. Organizational Unit:

Department Name:

Division Name:

f. Name and contact information of person to be contacted on matters involving this application:

Prefix: Ms.
* First Name: Molla
Middle Name:
* Last Name: Sarros
Suffix:

Title: Natural Resource Planner

Organizational Affiliation:

* Telephone Number: 410-537-4180
Fax Number:

* Email: molla.sarros@maryland.gov

Application for Federal Assistance SF-424

*** 9. Type of Applicant 1: Select Applicant Type:**

A: State Government

Type of Applicant 2: Select Applicant Type:

Type of Applicant 3: Select Applicant Type:

* Other (specify):

*** 10. Name of Federal Agency:**

Environmental Protection Agency

11. Catalog of Federal Domestic Assistance Number:

66.034

CFDA Title:

Surveys, Studies, Research, Investigations, Demonstrations, and Special Purpose Activities Relating to the Clean Air Act

*** 12. Funding Opportunity Number:**

EPA-OAR-OAQPS-22-01

* Title:

Enhanced Air Quality Monitoring for Communities

13. Competition Identification Number:

Title:

14. Areas Affected by Project (Cities, Counties, States, etc.):

Add Attachment | Delete Attachment | View Attachment

*** 15. Descriptive Title of Applicant's Project:**

Community partnership program to monitor and mitigate cumulative air pollution concentrations in communities with environment justice concerns.

Attach supporting documents as specified in agency instructions.

Add Attachments | Delete Attachments | View Attachments

Application for Federal Assistance SF-424

16. Congressional Districts Of:

* a. Applicant: 03 * b. Program/Project: 03

Attach an additional list of Program/Project Congressional Districts if needed.

Add Attachment | Delete Attachment | View Attachment

17. Proposed Project:

* a. Start Date: 11/01/2022 * b. End Date: 10/31/2024

18. Estimated Funding ($):

* a. Federal	497,861.00
* b. Applicant	55,137.00
* c. State	0.00
* d. Local	0.00
* e. Other	0.00
* f. Program Income	0.00
* g. TOTAL	552,998.00

*** 19. Is Application Subject to Review By State Under Executive Order 12372 Process?**

☒ a. This application was made available to the State under the Executive Order 12372 Process for review on 03/25/2022.

☐ b. Program is subject to E.O. 12372 but has not been selected by the State for review.

☐ c. Program is not covered by E.O. 12372.

*** 20. Is the Applicant Delinquent On Any Federal Debt? (If "Yes," provide explanation in attachment.)**

☐ Yes ☒ No

If "Yes", provide explanation and attach

Add Attachment | Delete Attachment | View Attachment

21. *By signing this application, I certify (1) to the statements contained in the list of certifications and (2) that the statements herein are true, complete and accurate to the best of my knowledge. I also provide the required assurances** and agree to comply with any resulting terms if I accept an award. I am aware that any false, fictitious, or fraudulent statements or claims may subject me to criminal, civil, or administrative penalties. (U.S. Code, Title 218, Section 1001)**

☒ ** I AGREE

** The list of certifications and assurances, or an internet site where you may obtain this list, is contained in the announcement or agency specific instructions.

Authorized Representative:

Prefix: Mr. * First Name: Thomas

Middle Name: J.

* Last Name: French

Suffix:

* Title: Director, Operational Services Administration

* Telephone Number: 410-537-3128 Fax Number:

* Email: tom.french@maryland.gov

* Signature of Authorized Representative: Thomas J French * Date Signed: 03/24/2022

BUDGET INFORMATION - Non-Construction Programs

OMB Number: 4040-0006
Expiration Date: 02/28/2022

SECTION A - BUDGET SUMMARY

Grant Program Function or Activity (a)	Catalog of Federal Domestic Assistance Number (b)	Estimated Unobligated Funds		New or Revised Budget		
		Federal (c)	Non-Federal (d)	Federal (e)	Non-Federal (f)	Total (g)
1. Enhanced Air Quality Monitoring for Communities Grant	66.034	$	$	$ 497,861.00	$	$ 497,861.00
2. Voluntary Cost Share (State)	66.034				55,137.00	55,137.00
3.						
4.						
5. Totals		$	$	$ 497,861.00	$ 55,137.00	$ 552,998.00

Standard Form 424A (Rev. 7- 97)
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SECTION B - BUDGET CATEGORIES

6. Object Class Categories	GRANT PROGRAM, FUNCTION OR ACTIVITY (1) Enhanced Air Quality Monitoring for Communities Grant	(2) Voluntary Cost Share (State)	(3)	(4)	Total (5)
a. Personnel	$ 7,500.00	$ 35,120.00	$	$	$ 42,620.00
b. Fringe Benefits	3,675.00	17,209.00			20,884.00
c. Travel	0.00	2,808.00			2,808.00
d. Equipment	100,000.00	0.00			100,000.00
e. Supplies	0.00	0.00			0.00
f. Contractual	0.00	0.00			0.00
g. Construction	0.00	0.00			0.00
h. Other	384,000.00	0.00			384,000.00
i. Total Direct Charges (sum of 6a-6h)	495,175.00	55,137.00			$ 550,312.00
j. Indirect Charges	2,686.00				$ 2,686.00
k. TOTALS (sum of 6i and 6j)	$ 497,861.00	$ 55,137.00	$	$	$ 552,998.00
7. Program Income	$	$	$	$	$

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SECTION C - NON-FEDERAL RESOURCES

(a) Grant Program	(b) Applicant	(c) State	(d) Other Sources	(e)TOTALS
8. Voluntary Cost Share (State)	$	$ 55,137.00	$	$ 55,137.00
9.				
10.				
11.				
12. TOTAL (sum of lines 8-11)	$	$ 55,137.00	$	$ 55,137.00

SECTION D - FORECASTED CASH NEEDS

	Total for 1st Year	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
13. Federal	$ 248,931.00	$ 137,232.00	$ 37,233.00	$ 37,233.00	$ 37,233.00
14. Non-Federal	$ 27,569.00	6,893.00	6,892.00	6,892.00	6,892.00
15. TOTAL (sum of lines 13 and 14)	$ 276,500.00	$ 144,125.00	$ 44,125.00	$ 44,125.00	$ 44,125.00

SECTION E - BUDGET ESTIMATES OF FEDERAL FUNDS NEEDED FOR BALANCE OF THE PROJECT

(a) Grant Program	FUTURE FUNDING PERIODS (YEARS) (b)First	(c) Second	(d) Third	(e) Fourth
16. Enhanced Air Quality Monitoring for Communities Grant	$ 248,931.00	$ 248,930.00	$	$
17. Voluntary Cost Share (State)	27,569.00	27,568.00		
18.				
19.				
20. TOTAL (sum of lines 16 - 19)	$ 276,500.00	$ 276,498.00	$	$

SECTION F - OTHER BUDGET INFORMATION

21. Direct Charges: 550,312.00

22. Indirect Charges: 2,686.00

23. Remarks:

SACOBY MIGUEL WILSON, PhD, MS

Phone: 202-230-2881 | Email: swilson2@umd.edu

Website: www.ceejh.center

EDUCATION

2005 **University of North Carolina, School of Public Health**, Chapel Hill, NC
Doctor of Philosophy in Environmental Health Sciences
USEPA STAR Fellowship (2000-2003)
NIEHS Minority Supplement (2003-2005)
Advisors: Dr. Mark Sobsey, PhD and Louise Ball, PhD

2000 **University of North Carolina, School of Public Health**, Chapel Hill, NC
Master of Science in Environmental Health Sciences
USEPA STAR Fellowship (1998-2000)
Advisor: Dr. Mark Sobsey, PhD

1998 **Alabama Agricultural & Mechanical University,** Normal, AL
Bachelor of Science in Biology/Ecotoxicology (minor: Environmental Science)
AAMU Honors Award; (Graduated magna cum laude)

PROFESSIONAL EXPERIENCE

2017-Present **Associate Professor (promoted with tenure in May 2017)**
Maryland Institute for Applied Environmental Health
School of Public Health, University of Maryland, College Park, MD

2011-Present **Director,** Community Engagement, Environmental Justice and Health (CEEJH),
Maryland Institute for Applied Environmental Health, University of Maryland, College Park, DMD

2011-2017 **Assistant Professor**
Maryland Institute for Applied Environmental Health
School of Public Health, University of Maryland, College Park, MD

2011-2017 **Assistant Professor**
Department of Epidemiology and Biostatistics
School of Public Health, University of Maryland, College Park, MD

2007-2011 **Research Assistant Professor**
University of South Carolina
Institute for Families in Society with Appointments in the College of Social Work and Department of Epidemiology and Biostatistics
Columbia, SC

AWARDS, FELLOWSHIPS, AND OTHER RECOGNITION (SELECT)

2008 North Carolina Environmental Justice Network **Steve Wing International Environmental Justice Award** Sponsored by the North Carolina Environmental Justice Network

2008 EPA Environmental Justice Achievement Award given to the West End Revitalization Association, Mebane, NC, member of WERA's project management team

2015 **APHA Environment Section Damu Smith Environmental Justice Award**

2012-2013 The Muriel R. Sloan Communitarian Award, School of Public Health, UMD-College Park

2014-2015 The George F. Kramer Practitioner of the Year Award, School of Public Health, University of Maryland-College Park

2016 UMD Council on the Environment Junior Faculty of the Year Award

2018 Audubon Naturalists Society Taking Nature Black Environmental Champion

2019-2020 The Muriel R. Sloan Communitarian Award, School of Public Health, UMD-College Park

BOARDS, LEADERSHIP POSITIONS, AND OTHER SERVICE (SELECT)

2021-Present **Member**, ASPPH Climate Advisory Committee
2021-Present **Member**, National Climate Assessment, Air Quality Team
2021-Present **Member**, Science Advisory Board, US Environmental Protection Agency
2021-Present **Member**, Advisory Board, Aclima
2020-Present Editor-in-Chief, *Environmental Justice*
2020-Present **Member**, Board, Citizen Science Association
2020-Present **Member,** NAS Board on Environmental Studies and Toxicology (BEST)
2019-Present **Member**, Climate Equity Advisory Board, Kresge Foundation
2017-2021 **Member**, National Environmental Justice Advisory Council (NEJAC)
2021-Present **Member and Co-Chair**, NEJAC Air Quality and Community Monitoring Workgroup
2021-Present **Member and Co-Chair**, NEJAC Financial Matters and Justice40 Workgroup
2017-Present **Member**, External Advisory Board, Gulf Coast HBCU-CBO Health Equity Consortium
2010-2018 **Board Member**, Community-Campus Partnerships for Health (CCPH)
2011-2014 **Member**, CDC/NCEH Scientific Board of Counselors (2011-2014)

PUBLICATIONS (SELECT)(~90 publications, 2233 Citations, h-index=25)

1. Cooper CB, Larson LR, Parrish JK, Bowser G Cavalier D, Dunn RR, Haklay M, Hawn C, Gupta KK, Jelks NO, Johnson VA, Katti M, Leggett Z, Wilson OR, **Wilson SM**. (2021). Inclusion in citizen science: The conundrum of rebranding. *Science.*
2. Hendricks M, Meyer M, **Wilson SM** (2021). Moving up the ladder is rising waters: community science as a pathway toward community control and flood resilience. *Citizen Science: Theory and Practice* (Accepted).
3. Shao Y, Kavi L, Boyle M, Louis LM, Pool W, Thomas SB, **Wilson SM**, Rule AM, Quiros-Alcala L. (2021). Real-time air monitoring of occupational exposures to particulate matter among hairdressers in Maryland: A pilot study. *Indoor Air.*
4. Ezeugoh RI, Puett R, Payne-Sturges D, Cruz-Cano R, **Wilson SM**. (2020). Air quality assessment of particulate matter near a concrete block plant and traffic in Bladensburg, Maryland. *Environmental Justice* 13(3) (2020): 75-85.
5. Northcross AL, Hsieh S, **Wilson SM**, Roper E, Dickerson RR, Norouzi P, Morris V. (2020). Monitoring neighborhood concentrations of $pm_{2.5}$ and black carbon: when using citywide averages underestimates impacts in a community with environmental justice issues. *Environmental Justice 13*(2), 27-35.
6. Driver A, Mehdizadeh C, Bara-Garcia S, Bodenreider C, Lewis J, **Wilson SM**. (2019). Utilization of the Maryland Environmental Justice Screening Tool: A Bladensburg, Maryland Case Study. *International journal of environmental research and public health, 16*(3), 348.
7. Jordan RC, Sorensen AE, Biehler D, **Wilson SM**, LaDeau S. (2019). Citizen science and civic ecology: merging paths to stewardship. *Journal of Environmental Studies and Sciences*, *9*(1), 133-143.
8. Burwell-Naney K, **Wilson SM**, Tarver SL, Svendsen E, Jiang C, Ogunsakin OA, Zhang H, Campbell D, Fraser-Rahim H. Baseline Air Quality Assessment of Goods Movement Activities before the Port of Charleston Expansion: A Community–University Collaborative. *Environmental Justice* 10(1): 1-10 (2017).
9. **Wilson SM**, Campbell D, Burwell K, Rice L, Williams E. Assessment and Impact of a Summer Environmental Justice and Health Enrichment Program: A Model for Pipeline Development, *Environmental Justice* 5(6):279-286 (2012a).
10. **Wilson SM**, Cooper J, Heaney CD, Wilson OR[$]. Built Environment Issues in Unserved and Underserved African-American Neighborhoods in North Carolina. *Environmental Justice* 1(2): 63-72 (2008b).

Attachment: Bios
Maryland Department of the Environment Staff

George (Tad) Aburn is the Director of the Air and Radiation Administration with the Maryland Department of the Environment. Mr. Aburn has served as the Administration's Director for nearly 17 years. He is responsible for overseeing the implementation of a wide variety of pollution control programs required by the Clean Air Act. Under his leadership, the administration has expanded its innovative research programs and continues to lead the region in adopting some of the Country's most aggressive pollution control programs covering mobile sources, area sources and large and small stationary sources. The administration also leverages innovative nontraditional programs and partnerships to achieve important local emissions reductions.

Molla Sarros is a Natural Resources Planner in the Air Quality Planning Program of the Air and Radiation Administration, MDE, and Chair of MDE's Alternative Transportation Group. Ms. Sarros has over 16 years of experience at MDE, where she manages projects, develops plans, and conducts environmental health research and analysis for the attainment of clean air quality and related national standards. This includes collaborating on coalitions with 12 other states and 8 local governments to reduce air pollution emissions from industries such as power plants/electricity production and transportation such as diesel trucks and increased driving. She manages and prepares MDE air quality grant applications for environmental justice related projects. She analyzes hundreds of pages of regulations and environmental health study results, researches health impacts of air pollution and climate change, maps air pollutant data using ArcGIS Online, and analyzes large data sets in Microsoft Excel. In addition, she translates health studies and other scientific information into lay terms and delivers oral presentations to community groups and state staff.

Michael Woodman is the Deputy Program Manager of the Air Monitoring Program in the Air and Radiation Administration with the Maryland Department of the Environment. Mr. Woodman has served as the Manager of the Air Quality Measurements, Modeling, and Analysis Division within the Air Monitoring Program for over 14 years. Mr. Woodman is responsible for managing and coordinating a wide variety of scientific air quality research and modeling activities. The air quality research activities have supported important policy measures that have reduced pollutant emissions and improved Maryland's air quality.

Shannon Heafey is the Air Quality Permit Program's Public Participation Coordinator with the Maryland Department of the Environment's Air and Radiation Administration. She has 27 years of experience in this position. As Coordinator, she moderates the informational meetings and formal hearings associated with the Air Quality permitting process with an emphasis on respect for, and inclusion of, community input. She fosters an environment of open communication and focuses on ensuring that public concerns are presented to applicants and permit writers during

the processing of air quality construction permit applications. She facilitates communication between the Department and the following: community groups, environmental groups, concerned community residents, other programs and administrations within MDE, and local and federal government agencies. This includes state and county departments of environmental protection, EPA, and local, state, and federal legislators. Meetings and hearings for air quality permit applications have taken place in the Curtis Bay, Cheverly, and Turner Station areas. These opportunities for interaction have provided insight on the historic and current burdens affecting the quality of life in these communities.

EDF
ENVIRONMENTAL DEFENSE FUND
Finding the ways that work

February 16, 2022

Tad Aburn
Director, Air & Radiation Administration
Air and Radiation Administration
Maryland Department of the Environment
1800 Washington Boulevard, Suite 730
Baltimore, Maryland 21230

Dear Mr. Aburn:

We are pleased to support the Maryland Department of Environment's grant application entitled "Partnership Program to Compare Cumulative Air Pollution Concentrations in Communities with Environmental Justice Concerns and in Less Burdened Communities." This is MDE's application in response to EPA's Request for Applications opportunity, EPA-OAR-OAQPS-22-01. The project will identify and characterize cumulative air pollution exposure disparities in communities with environmental pollution burdens, compared with other communities that do not have those burdens.

Environmental Defense Fund (EDF) has been working with MDE and partners over the last several years to identify potential emission reduction strategies across the Baltimore region. More recently, EDF has provided technical support on a number of projects supporting clean air projects in Baltimore, including an assessment of clean air strategies at the Port of Baltimore as well as a recent DERA award to demonstrate electric drayage vehicles in the region in partnership with IKEA and the drayage carrier Road One.

EDF commits to participating in this project as a member of the Steering Committee. Activities will include:

- Monthly Meetings to review project scope, progress and provide input on key project decisions
- Provide feedback and insight into the selection of communities to host air sensors
- Review and provide feedback about the type and location of air monitoring equipment,
- Participate in the review and development of the final report and recommendations as key outcomes of this project.

Baltimore is home to significant air quality challenges, with asthma prevalence rates higher than the national average for adults and more than double the national average for children, according to the Baltimore City Health Department; we encourage EPA to fund this project - one that will have significant and immediate health benefits for communities in the area. EDF appreciates the leadership that MDE has taken to ensure better air quality in the region, and we look forward to working together and appreciate the opportunity to collaborate.

Sincerely,

Elena Craft, Ph.D.
Senior Director, Climate and Air, EDF

301 Congress Avenue
Austin, TX 78701

T 512 478 5161
F 512 478 8140
edf.org

New York, NY / Austin, TX / Bentonville, AR / Boston, MA / Boulder, CO / Raleigh, NC
Sacramento, CA / San Francisco, CA / Washington, DC / Beijing, China / La Paz, Mexico

ENVIRONMENTAL INTEGRITY PROJECT

1000 Vermont Avenue, NW
Suite 1100
Washington, DC 20005
Main: 202-296-8800
Fax: 202-296-8822
www.environmentalintegrity.org

February 4, 2022

Tad Aburn
Director, Air & Radiation Administration
Maryland Department of the Environment
1800 Washington Boulevard, Suite 730
Baltimore, Maryland 21230

Re: EPA Request for Applications, EPA-OAR-OAQPS-22-01
Enhanced Air Quality Monitoring for Communities

Dear Mr. Aburn:

The Environmental Integrity Project ("EIP") is pleased to support the Maryland Department of Environment's ("MDE's") grant application entitled "Partnership Program to Compare Cumulative Air Pollution Concentrations in Communities with Environmental Justice Concerns and in Less Burdened Communities." This is MDE's application in response to EPA's Request for Applications opportunity, EPA-OAR-OAQPS-22-01. The project will identify and characterize cumulative air pollution exposure disparities in communities with environmental pollution burdens, compared with other communities that do not have those burdens.

While EIP advocates for improved environmental agency performance at the national and state levels (across multiple states), we have worked cooperatively with MDE on projects and have deep appreciation for the expertise and dedication of MDE staff. This includes staff within MDE's Air & Radiation Administration ("ARA"). EIP benefitted from ARA staff's air quality monitoring expertise in 2014 and 2015 when we were sampling ambient $PM_{2.5}$ levels in the industrialized South Baltimore neighborhood of Curtis Bay. MDE staff reviewed and provided feedback on an early draft of a report discussing our data and also allowed us to conduct co-locations with one of their $PM_{2.5}$ monitors, which helped us to improve the quality of our data.[1]

EIP strongly supports MDE's grant application, especially MDE's planned partnership with researchers at the University of Maryland and Johns Hopkins University. EIP has met and worked with scientists at these institutions on air quality and environmental justice issues, and we believe that that this team would be exceptionally well-qualified to carry out this project. We also appreciate MDE's intent to partner with the Curtis Bay and Turner Station communities in the Baltimore area as we have long-standing relationships with groups based in both neighborhoods. We believe that the data and findings that MDE proposes to gather would be of significant interest and potential use to these communities.

We are pleased to commit to participate in this project as a member of the Steering Committee. At present, EIP is able to commit only to reviewing and providing feedback about the type and

[1] The final report on EIP's PM2.5 sampling project in Baltimore is available on our website at https://environmentalintegrity.org/wp-content/uploads/2016/11/PM2.5Report.pdf.

location of air monitoring equipment. While we are unable to make any other commitments at this time due to time constraints, we hope to have the capacity to participate in other ways. We intend to continue discussions with MDE regarding our capacity to participate in this project.

EIP is a 501 (c)(3) nonpartisan, nonprofit watchdog organization that advocates for effective enforcement of environmental laws. Comprised of former EPA enforcement attorneys, public interest lawyers, analysts, investigators, and community organizers, EIP has three goals: (1) to illustrate through objective facts and figures how the failure to enforce or implement environmental laws increases pollution and harms public health; (2) to hold federal and state agencies, as well as individual corporations, accountable for failing to enforce or comply with environmental laws; and; (3) to help local communities obtain the protections of environmental laws.

Although headquartered in Washington, D.C., EIP has advocated for cleanup of Maryland power plants and other large pollution sources that affect human health in the state for over a decade. Starting in 2011, we have intentionally focused on working with residents of communities in the Baltimore area that are overburdened with pollution and inadequate infrastructure. Our goal has been to partner with these communities to address environmental injustice affecting their neighborhoods.

EIP believes that MDE's grant application and the resultant analyses have significant potential to improve scientific understanding of cumulative pollution risk, and, we hope, to improve quality of life in the Maryland neighborhoods that bear the greatest burden.

We are excited to be a part of this project and thank you for the opportunity to collaborate.

Sincerely,

Leah Kelly
Senior Attorney
Environmental Integrity Project
1000 Vermont Ave. NW, Ste 1100
Washington, D.C. 20005
Phone: 202-263-4448
Email: lkelly@environmentalintegrity.org

SIERRA CLUB
MARYLAND CHAPTER

Maryland Sierra Club
P.O. Box 278
Riverdale, MD 20738

February 9, 2022

Tad Aburn
Director, Air & Radiation Administration
Air and Radiation Administration
Maryland Department of the Environment
1800 Washington Boulevard, Suite 730
Baltimore, Maryland 21230

Re: EPA Request for Applications, EPA-OAR-OAQPS-22-01 Enhanced Air Quality Monitoring for Communities

Dear Mr. Aburn:

We are pleased to support the Maryland Department of Environment's grant application entitled "Partnership Program to Compare Cumulative Air Pollution Concentrations in Communities with Environmental Justice Concerns and in Less Burdened Communities." This is MDE's application in response to EPA's Request for Applications opportunity, EPA-OAR-OAQPS-22-01. The project will identify and characterize cumulative air pollution exposure disparities in communities with environmental pollution burdens, compared with other communities that do not have those burdens.

Maryland Sierra Club is delighted to commit to participate in this project as a member of the Steering Committee. Our activities will include:

- Monthly Meetings to review project scope, progress and provide input on key project decisions.
- Provide feedback and insight into the selection of communities to host air sensors.
- Review and provide feedback about the type and location of air monitoring equipment.
- Participate in the review and development of the final report and recommendations as key outcomes of this project.

Founded in 1892, the Sierra Club is America's oldest and largest grassroots environmental organization. The Maryland Chapter has over 70,000 members and supporters, and the Sierra Club nationwide has over 800,000 members and nearly four million supporters. We are excited to be a part of this project and thank you for the opportunity to collaborate.

Sincerely,

Ali B. Ishaque, PHD
Executive Committee Member
Sierra Club Lower Eastern Shore Group

Josh Tulkin
Director
Maryland Sierra Club

MARYLAND
LATINOS
UNIDOS

Letter of Support

For the Air and Radiation Administration,
Maryland Department of the Environment

January 27, 2022

STAFF

Dr. Gabriela D. Lemus - Executive Director

Antonio Chaurand - Communications Associate

Susana Hernández Martín - Communications Fellow

Walter Saba - MALVEC Campaign Manager

Caylie Tuerack - Public Engagement & Research Associate

STEERING COMMITTEE

EXECUTIVE COMMITTEE

Veronica Cool - Co-Founder & CEO and Chair Cool & Associates LLC

Luis Gutierrez - President and CEO Dream Management, Inc.

Alberto Grosmark - Lean Six Master Black Belt Manager, Accenture Federal Services

Joseph Morales - Managing Attorney The Morales Law Firm

MEMBERS

Pat Arzuaga - Senior Counsel, Kaiser Foundation Health Plan, Inc.

Elda Devarie - President, EMD Sales, Inc.

Cesiah Fuentes - Executive Director, Maryland Legislative Latino Caucus (MLLC)

Monica Guerrero Vazquez - Executive Director, Centro SOL

Heather Iliff - CEO, Maryland Association of Non-profit Organizations (MANO)

Elizabeth Ysla Leight - Director of Government Relations and Legal Affairs, Society of Professional Benefit Administrators

Maria Pilar Rodriguez - President, MPR Business Solutions, LLC / Founder, Maryland Hispanic Chamber of Commerce

Inez Stewart - Senior Vice - President - Human Resources Johns Hopkins Medicine

Maryland Latinos Unidos (MLU) is a program of Maryland Nonprofits
1500 Union Avenue | Suite 2500 Baltimore, MD 21211 Phone: 410 -727- 6367

MARYLAND
LATINOS
UNIDOS

January 27, 2022

Tad Aburn
Director, Air & Radiation Administration
Air and Radiation Administration
Maryland Department of the Environment
1800 Washington Boulevard, Suite 730
Baltimore, Maryland 21230

Re: EPA Request for Applications, EPA-OAR-OAQPS-22-01
Enhanced Air Quality Monitoring for Communities

Dear Mr. Aburn:

We are pleased to support the Maryland Department of Environment's grant application entitled "Partnership Program to Compare Cumulative Air Pollution Concentrations in Communities with Environmental Justice Concerns and in Less Burdened Communities." This is MDE's application in response to EPA's Request for Applications opportunity, EPA-OAR-OAQPS-22-01. The project will identify and characterize cumulative air pollution exposure disparities in communities with environmental pollution burdens, compared with other communities that do not have those burdens.

Maryland Latinos Unidos has worked with MDE to address disproportionate climate impacts on Latino communities, especially on low-income and undocumented communities who live and work among us. Underserved communities face a multitude of barriers from a lack of data to inability in obtaining state funding. Barriers can range from systemic racism, to lack of awareness. This proposal for air monitoring is a unique opportunity where communities could support agency efforts to expand their outreach into underserved areas where they need to expand their work.

We are pleased to commit to participate in this project as a member of the Steering Committee. Our activities will include:

- Monthly Meetings to review project scope, progress and provide input on key project decisions
- Provide feedback and insight into the selection of communities to host air sensors
- Review and provide feedback about the type and location of air monitoring equipment,
- Provide community input on the development of the Cumulative Relative Risk Analysis and
- Participate in the review and development of the final report and recommendations as key outcomes of this project.

Launched in 2020, Maryland Latinos Unidos (MLU) is a statewide association of Latinx nonprofits, community organizations, and business leaders housed within the nonprofit association Maryland Nonprofits. MLU was launched with two primary objectives. Most immediately, MLU is working to meet urgent needs in the Latinx community related to the COVID-19 pandemic and combat the disproportionate impact the pandemic has had on communities of color. Long term, MLU is working to build an equitable infrastructure to address the many disparities and barriers faced by Latinos in Maryland. Our focus is not only on community health, but also housing, education, employment, and environmental factors that impact Latinos' well-being by providing technical assistance through community-organizing, advocacy, and civic engagement.

We are excited to be a part of this project and thank you for the opportunity to collaborate.

Sincerely

Dr. Gabriela D. Lemus
Executive Director

WE ARE STRONGER TOGETHER!

NORTH POINT PENINSULA COUNCIL

January 31, 2022

Tad Aburn
Director, Air & Radiation Administration
Air and Radiation Administration
Maryland Department of the Environment
1800 Washington Boulevard, Suite 730
Baltimore, Maryland 21230

Re: EPA Request for Applications, EPA-OAR-OAQPS-22-01
Enhanced Air Quality Monitoring for Communities

Dear Mr. Aburn:
We are pleased to support the Maryland Department of Environment's grant application entitled "Partnership Program to Compare Cumulative Air Pollution Concentrations in Communities with Environmental Justice Concerns and in Less Burdened Communities." This is MDE's application in response to EPA's Request for Applications opportunity, EPA-OAR-OAQPS-22-01. The project will identify and characterize cumulative air pollution exposure disparities in communities with environmental pollution burdens, compared with other communities that do not have those burdens.
The North Point Peninsula Council has worked with MDE to ensure that residents of the North Point Peninsula are aware of the challenges and the strides that have been made regarding local air quality. We are pleased to commit to participate in this project as a member of the Steering Committee. Our activities will include:

- Monthly Meetings to review project scope, progress and provide input on key project decisions
- Provide feedback and insight into the selection of communities to host air sensors
- Review and provide feedback about the type and location of air monitoring equipment,
- Provide community input on the development of the Cumulative Relative Risk Analysis and
- Participate in the review and development of the final report and recommendations as key outcomes of this project.

The North Point Peninsula Council, celebrating our 51st year representing the community in civic matters, takes very seriously the health impacts that industrial activities create. Having suffered from decades of steel making pollution we are now working with others to remediate those legacy discharges as well as identify current impacts.

We are excited to be a part of this project and thank you for the opportunity to collaborate.

Sincerely

Francis Taylor. President
North Point Peninsula Council

P.O. Box 444 Fort Howard, MD 21052-0444

MARYLAND LEAGUE OF CONSERVATION VOTERS

EDUCATION FUND

March 8, 2022

Tad Aburn
Director, Air & Radiation Administration
Maryland Department of the Environment
1800 Washington Boulevard, Suite 730
Baltimore, Maryland 21230

Re: EPA Request for Applications, EPA-OAR-OAQPS-22-01
Enhanced Air Quality Monitoring for Communities

Dear Mr. Aburn:

As the Director of Climate Policy and Justice at the Maryland League of Conservation Voters Education Fund, I strongly endorse the Maryland Department of Environment's grant application entitled "Partnership Program to Compare Cumulative Air Pollution Concentrations in Communities with Environmental Justice Concerns and in Less Burdened Communities" that is seeking funding through EPA's opportunity EPA-OAR-OAQPS-22-01. The project will identify and characterize cumulative air pollution exposure disparities in communities with environmental pollution burdens, compared with other communities that do not have those burdens.

The Maryland League of Conservation Voters Education Fund (Maryland LCVEF) is a nonprofit, nonpartisan environmental organization dedicated to maximizing the participation of all Marylanders in public policy decisions made at the state and local levels regarding Maryland's air, land, water, and communities. Our Chispa Maryland program is a community-based program established in 2014 to address the underlying environmental issues that impact communities, particularly low-wealth communities, and communities of color in Maryland. The long-term goal of Chispa Maryland is to increase the health and quality of life of the communities we serve.

Since 2015, Maryland LCVEF and its Chispa Maryland program have partnered with the Center for Community Engagement, Environmental Justice, and Health (CEEJH). We have collaborated in developing and delivering environmental education activities to Latino communities in Langley Park and surrounding communities in Prince George's County, Maryland. Specifically, CEEJH has assisted us with air quality monitoring trainings, and workshops and community meetings to explore and educate about connections between the environment and social, economic and health outcomes.

Maryland LCVEF is pleased to commit to participate in this project as a member of the Steering Committee. Our activities will include:

- Monthly Meetings to review project scope, progress and provide input on key project decisions
- Provide feedback and insight into the selection of communities to host air sensors
- Oversee community outreach, community partnership building, community training, and community workforce development
- Review and provide feedback about the type and location of air monitoring equipment
- Provide community input on the development of the cumulative air pollution exposure analysis
- Provide input into the development and implementation of air pollution mitigation measures
- Participate in the review and development of the final report and next step recommendations

In closing, Maryland LCVEF-Chispa Maryland strongly endorses this proposed project. The goals and objectives of the project are consistent with our vision to help build capacity in impacted communities and empower residents and other stakeholders to be engaged in decisions that can improve their health and quality of life. This project can help the communities that we serve become healthier, more equitable, and more sustainable. Thank you for the opportunity to collaborate.

Sincerely,

Rebecca Rehr, MPH
Director, Climate Policy & Justice
Maryland League of Conservation Voters Education Fund

CAF

WALKIRIA POOL, PRESIDENT

March 9, 2022

Tad Aburn
Director, Air & Radiation Administration
Air and Radiation Administration
Maryland Department of the Environment
1800 Washington Boulevard, Suite 730
Baltimore, Maryland 21230

Re: EPA Request for Applications, EPA-OAR-OAQPS-22-01
Enhanced Air Quality Monitoring for Communities

Dear Mr. Aburn:

We are pleased to support the Maryland Department of Environment's grant application entitled "Partnership Program to Compare Cumulative Air Pollution Concentrations in Communities with Environmental Justice Concerns and in Less Burdened Communities." This is MDE's application in response to EPA's Request for Applications opportunity, EPA-OAR-OAQPS-22-01. The project will identify and characterize cumulative air pollution exposure disparities in communities with environmental pollution burdens, compared with other communities that do not have those burdens.

CENTRO DE APOYO FAMILIAR OR CENTER FOR ASSISTANCE TO FAMILIES (CAF) has worked closely with MDE in the area of environmental justice program. This Program works directly to increase awareness and education in minority communities and create a sustainable network of environmental justice advocates throughout community and faith- based organizations. Moreover, we support the focus on populations of concern: communities of color and low-wealth communities who are differentially impacted by environmental hazards and climate change.

We are pleased to commit to participate in this project as a member of the Steering Committee. Our activities will include:

- Monthly Meetings to review project scope, progress and provide input on key project decisions
- Provide feedback and insight into the selection of communities to host air sensors
- Support outreach, partnership building, and workforce development with communities
- Review and provide feedback about the type and location of air monitoring equipment
- Provide community input on the development of the cumulative air pollution exposure analysis
- Provide input into the development and implementation of air pollution mitigation measures
- Participate in the review and development of the final report and next step recommendations

CAF's mission is to transform communities through economic and educational empowerment in collaboration with community and faith-based organizations. In Maryland, CAF focuses on our Community Transformation Model, which seeks to empower families and communities with resources such as food distribution, health, jobs, businesses, housing opportunities and other key resources.

We are excited to be a part of this project and thank you for the opportunity to collaborate.

Sincerely,

Walkiria Pool
President and Founder

Turner Station Conservation Teams, Inc.

323 Sollers Point Road
Dundalk, MD 21222
www.turnerstation.org

President: **Gloria E. Nelson**
Vice President: **Michael Thompson**
Secretary: **Maurisha Graves White**

January 28, 2022

Tad Aburn
Director, Air & Radiation Administration
Air and Radiation Administration
Maryland Department of the Environment
1800 Washington Boulevard, Suite 730
Baltimore, Maryland 21230

Re: EPA Request for Applications, EPA-OAR-OAQPS-22-01
Enhanced Air Quality Monitoring for Communities

Dear Mr. Aburn:

We are pleased to support the Maryland Department of Environment's grant application entitled "Partnership Program to Compare Cumulative Air Pollution Concentrations in Communities with Environmental Justice Concerns and in Less Burdened Communities." This is MDE's application in response to EPA's Request for Applications opportunity, EPA-OAR-OAQPS-22-01. The project will identify and characterize cumulative air pollution exposure disparities in communities with environmental pollution burdens, compared with other communities that do not have those burdens.

The Turner Station Conservation Teams, Inc (TSCT), community association, has worked with MDE over a period of years to improve the health, safety, and well-being of our residents.

We are pleased to commit to participate in this project as a member of the Steering Committee. Our activities will include:

- Monthly Meetings to review project scope, progress and provide input on key project decisions
- Provide feedback and insight into the selection of communities to host air sensors
- Review and provide feedback about the type and location of air monitoring equipment.
- Provide community input on the development of the Cumulative Relative Risk Analysis and
- Participate in the review and development of the final report and recommendations as key outcomes of this project.

We are excited to be a part of this project and thank you for the opportunity to collaborate.

Sincerely

Gloria E. Nelson
TSCT, President

GREATER
Baybrook
ALLIANCE

Tad Aburn
Director, Air & Radiation Administration
Maryland Department of the Environment
1800 Washington Boulevard, Suite 730
Baltimore, MD 21230

February 15, 2022

Re: EPA Request for Applications, EPA-OAR-OAQPS-22-01
Enhanced Air Quality Monitoring for Communities

Dear Mr. Aburn:

We are excited to support the Maryland Department of Environment's "Partnership Program to Compare Cumulative Air Pollution Concentrations in Communities with Environmental Justice Concerns and in Less Burdened Communities" that is seeking funding through the EPA's "Enhanced Air quality Monitoring for Communities" grant opportunity.

The air quality monitoring projects that could emerge from this grant are very important to us, the Greater Baybrook Alliance (GBA). Our organization's mission is to act as a catalyst and conduit for equitable development, reinvestment, and environmental justice in the neighborhoods of Brooklyn, Brooklyn Park, and Curtis Bay.

The underserved community we assist is exposed to a wide array of environmental hazards and experiences air quality that is disproportionately lower than in neighboring areas. According to the EPA's EJSCREEN, our neighborhoods have a demographic index of 44%, including 45% people of color, 42% low income, and 22% with less than high school education. Regarding air quality, the PM2.5 and the NATA Respiratory Hazard EJ Index are, respectively, in the 61st and 62nd percentile compared to the rest of Maryland. All other EJSCREEN indicators demonstrate equal or higher levels of environmental and health risks for the area. Also, as reported by the Centers for Disease Control and Prevention's Social Vulnerability Index (SVI), the area has an average socioeconomic SVI score of 0.64, indicating moderate to high vulnerability. Not surprisingly, life expectancy in these neighborhoods is 69.5 years, compared to 72.7 across the city.

Although our community has a long history of disproportionate exposure to environmental hazards, disinvestment, and public neglect, we continue to fight for environmental justice. When a trash incinerator was proposed to be constructed near our community, our residents loudly voiced their opposition and were instrumental in the cancelation of the project. The GBA neighborhoods have had two monitoring programs sited here. One is still ongoing and is funded under EPA's SEARCH program. These programs have enabled us to obtain a deeper understanding of the area's air quality. We understand and appreciate the power of data, as it substantiates the environmental justice reality of our underserved community. But despite our efforts, our neighborhoods still experience high rates of environmental exposure and risk. For instance, a portion of the Curtis Bay CSX Coal Terminal exploded in December 2021 due to a build-up of coal dust, testing once more the endurance of our residents to cumulative health hazards.

Finally, the GBA is eager to participate and contribute to the partnership program proposed by the Maryland Department of Environment, and we commit to:

- Participate in monthly meetings to review project scope, progress, and provide input on key project decisions.
- Provide feedback and insight into the selection of communities to host air sensors.
- Review and provide feedback about the type and location of air monitoring equipment.
- Provide community input on the development of the Cumulative Relative Risk Analysis.
- Participate in the review and development of the final report and recommendations as key outcomes of this project.

The "Partnership Program to Compare Cumulative Air Pollution Concentrations in Communities with Environmental Justice Concerns and in Less Burdened Communities" has the potential to further the area's environmental equity, which is the overarching goal we strive to achieve. Data is crucial to communicate the health and environmental disparities present in our vulnerable neighborhoods and help leverage the funds needed to alleviate and mitigate the socio-economic and environmental perils endured by our residents.

Best Regards,

Meredith Chaiken
Executive Director

March 11, 2022

Tad Aburn
Director, Air & Radiation Administration
Air and Radiation Administration
Maryland Department of the Environment
1800 Washington Boulevard, Suite 730
Baltimore, Maryland 21230

Re: EPA Request for Applications, EPA-OAR-OAQPS-22-01
Enhanced Air Quality Monitoring for Communities

Dear Mr. Aburn:

We are pleased to support the Maryland Department of Environment's grant application entitled "Partnership Program to Compare Cumulative Air Pollution Concentrations in Communities with Environmental Justice Concerns and in Less Burdened Communities." This is MDE's application in response to EPA's Request for Applications opportunity, EPA-OAR-OAQPS-22-01. The project will identify and characterize cumulative air pollution exposure disparities in communities with environmental pollution burdens, compared with other communities that do not have those burdens.

The Town of Cheverly has worked with MDE to support the Cheverly Targeted Inspection Initiative in June 2021, using the Cheverly hyper-local Purple Air monitoring sensors. Cheverly residents reported incidents affecting air quality, notably from diesel vehicles in the greater Cheverly area. MDE continues to work with the community to address air quality related concerns due to noxious odors and explosions.

We are pleased to commit to participate in this project as a member of the Steering Committee. Our activities will include:

- Monthly Meetings to review project scope, progress and provide input on key project decisions
- Provide feedback and insight into the selection of communities to host air sensors
- Support outreach, partnership building, and workforce development with communities
- Review and provide feedback about the type and location of air monitoring equipment
- Provide community input on the development of the cumulative air pollution exposure analysis
- Provide input into the development and implementation of air pollution mitigation measures
- Participate in the review and development of the final report and next step recommendations

Cheverly is located adjacent to several industrial zones and a large, old recycling facility. Concerns regarding cumulative industrial and traffic impacts on air quality led the Town to partner with the U. of Maryland School of Public Health to implement the Air Quality Monitoring Project with over 20 Purple Air sensors hosted by community members. We are pleased to see MDE's use of the network on our behalf and are excited to be a part of this project. Thank you for the opportunity to collaborate.

Sincerely

Karen L. Moe

Karen L. Moe
Cheverly Air Quality Monitoring Project Liaison
Green Infrastructure Committee
Town of Cheverly, Maryland

Manifest for Grant Application # GRANT13579835

Grant Application XML file (total 1):

1. GrantApplication.xml. (size 25715 bytes)

Forms Included in Zip File(total 6):

1. Form ProjectNarrativeAttachments_1_2-V1.2.pdf (size 16034 bytes)

2. Form SF424_3_0-V3.0.pdf (size 24156 bytes)

3. Form SF424A-V1.0.pdf (size 23261 bytes)

4. Form EPA4700_4_3_0-V3.0.pdf (size 22793 bytes)

5. Form OtherNarrativeAttachments_1_2-V1.2.pdf (size 16003 bytes)

6. Form EPA_KeyContacts_2_0-V2.0.pdf (size 37388 bytes)

Attachments Included in Zip File (total 7):

1. OtherNarrativeAttachments_1_2 OtherNarrativeAttachments_1_2-Attachments-1235-Attachment1_PartnershipLetters of Committment.pdf application/pdf (size 2012164 bytes)

2. OtherNarrativeAttachments_1_2 OtherNarrativeAttachments_1_2-Attachments-1237-Attachement3_MDE Staff Bios.pdf application/pdf (size 383535 bytes)

3. OtherNarrativeAttachments_1_2 OtherNarrativeAttachments_1_2-Attachments-1236-Attachment2_Additional_LettersOfSupport.pdf application/pdf (size 2015291 bytes)

4. ProjectNarrativeAttachments_1_2 ProjectNarrativeAttachments_1_2-Attachments-1240-Narrative_EJAirMonARPGrant_16mar22_FINAL2.pdf application/pdf (size 330661 bytes)

5. OtherNarrativeAttachments_1_2 OtherNarrativeAttachments_1_2-Attachments-1239-Attachment5_CV_UMD_RussDickerson.pdf application/pdf (size 551321 bytes)

6. OtherNarrativeAttachments_1_2 OtherNarrativeAttachments_1_2-Attachments-1238-Attachment4_CV_UMD_SacobyWilson.pdf application/pdf (size 380433 bytes)

7. OtherNarrativeAttachments_1_2 OtherNarrativeAttachments_1_2-Attachments-1234-Attachment1_QualityAssuranceStatement.pdf application/pdf (size 380733 bytes)

U.S. EPA RFA NUMBER: EPA-OAR-OAQPS-22-01
"Enhanced Air Quality Monitoring for Communities"
March 16, 2022

I. Cover Page

Project Title: Community Partnership Program to Monitor and Mitigate Cumulative Air Pollution Concentrations in Communities with Environmental Justice (EJ) Concerns

Applicant Information: Maryland Department of the Environment, 1800 Washington Blvd., Suite 730, Baltimore, MD 21230, Primary contact: Molla Sarros, Natural Resources Planner, Air and Radiation Administration, (410) 537-4180 molla.sarros@maryland.gov, DUNS: 1696400620000

Set-Aside: No set-aside

Brief Description of Applicant Organization: Maryland Department of the Environment (MDE) is a state agency whose mission is "To protect and restore the environment for the health and well-being of all Marylanders." MDE does this through regulating, permitting, enforcement; research and data collection; technical assistance; education; and state policies. MDE has worked with multiple underserved communities with concerns over environmental justice issues (EJ communities) to build partnerships and implement hyper-local air monitoring networks.

Project Partners: EJ communities: Town of Cheverly, Mayor Kayce Munyeheh; greater Cheverly area, Centro de Apoyo Familiar, Dr. Walkaria Pool; Turner Station community association, Gloria Nelson; Curtis Bay, South Baltimore Community Land Trust, Greg Sawtell; and greater Curtis Bay area, Greater Baybrook Alliance, Meredith Chaiken. Local University of Maryland (UMD) Leadership: Dr. Sacoby Wilson, Director UMD Center for Community Engagement, Environmental Justice, and Health (CEEJH) and Dr. Russell Dickerson, UMD Department of Atmospheric and Oceanic Science (AOSC).

Project Location: Four locations including: 3 EJ communities: Cheverly, Maryland (MD) 20781 and 20785; Curtis Bay, Baltimore City, MD 21226; and Turner Station, Dundalk, MD 21222. One comparison site: Annapolis, MD 21401

Air Pollutant Scope: At least: coarse and fine particulate matter (PM) including diesel exhaust/black carbon, nitrogen dioxide (NO_2), ozone (O_3), and a hazardous air pollutant (HAP) such as benzene, toluene, xylene, a metal (e.g., lead, cadmium, arsenic) or another indicator of industrial emissions. As resources allow: include other air pollutants linked to cumulative impacts.

Budget Summary:

EPA Funding Requested:	Total Project Cost
$497,861	$552,998

Project Period: November 1, 2022, to October 31, 2024

Short Project Description: Objective: This project, community driven in all aspects, will identify and implement air pollution exposure and risk reduction measures based on community recommendations and data from multi-pollutant air sensor supersites in 3 EJ communities. Activities, outputs, and outcomes will include community partnerships and training; a community partnership steering committee guiding the project; a technical advisory group; community workforce development; air sensor and other data analyses, increased community awareness of air pollution, air pollution monitoring and mitigation, and policy changes. This includes deployment of a hyper-local network of sensors, traditional air monitoring, and other measurement & fingerprinting techniques to link measured data to sources contributing to high exposures.

II. Workplan

Section 1 – Project Summary and Approach (30 total possible points)

A. Overall Project (20 possible points)

This project, to be conducted in partnership with EJ communities, is designed to develop and

implement a community-based plan to reduce exposure and risk from the cumulative impact of multiple air pollutants in 3 EJ communities. Community input and data from the 3 cumulative impact air sensor supersites and a comparison site will be used to inform the community and help identify appropriate mitigation strategies. From there, the project will move to quickly implement air pollution reduction programs to reduce inequitable exposures in the EJ communities. In particular, it will use commercially available air sensor technology to measure multiple air pollutants in 3 communities in Maryland in Prince George's (PG) County and the Baltimore metropolitan region. The project builds on MDE's source inspection history for air quality in EJ communities and the 2021 PurpleAir fine $PM_{2.5}$ air sensor project in Cheverly, Maryland. The project also builds on a George Washington University study that found locally elevated $PM_{2.5}$ and black carbon concentrations in Ivy City. See doi.org/10.1089/env.2019.0026.

The Steering Committee will include all of the "Project Partners" (see the cover sheet). The EJ communities (see pgs. 4-5 and 7-8) will be partners in decision-making on the committee from the beginning. The other partners on the Steering Committee include 2 universities with air quality & environmental health expertise. The Steering Committee will be involved in all aspects of the project, such as:

- Providing project-related air quality briefings to interested EJ communities
- Enlisting community support for the implementation of cumulative impact assessment and exposure reduction programs to be implemented during the study
- Selecting supersites and finalizing pollutants to be included in the air monitoring
- Encouraging community resident participation in the actual air monitoring process
- Providing input on the cumulative impact exposure assessment
- Developing recommendations for future cumulative impact air pollution analyses

As the applicant/grantee, MDE will also provide administrative support for the project and support the Steering Committee as needed. Technical advisors and additional partners include the Maryland Department of Health (MDH), Chispa/Maryland League of Conservation Voters, Maryland Latinos Unidos, North Point Peninsula Council, Environmental Integrity Project (EIP), Sierra Club Maryland Chapter, Environmental Defense Fund, Johns Hopkins University Bloomberg School of Public Health, & George Washington University Milken Institute School of Public Health.

The activities in this project support EPA's FY2022-26 Strategic Plan, "Goal 4, 'Ensure Clean and Healthy Air for All Communities;' and Objective 4.1, 'Improve Air Quality and Reduce Localized Pollution and Health Impacts.'" Maryland is partnering with local communities, businesses, legislators, and academia to advance EJ in MD, to carry out the work of "prioritiz[ing] engagement with low-income & marginalized communities that for decades have been overburdened with air pollution & other environmental hazards" (RFA). MDE is also leveraging CEEJH's EJ partnerships & work on EJ, and on community engagement & community hyper-local air quality monitoring.

Project work is divided in two main phases as listed below and detailed in the timeline and milestones on page 9. All aspects of this grant project will be community driven.

- Phase 1 will take 6 months and include: (1) community partnership Steering Committee meetings; (2) community members and partners leading outreach meetings, workshops, and training sessions, in the EJ communities; (3) selecting supersites in 3 communities and working with community partners to deploy at least 1 set of air sensors per supersite to measure concentrations of ambient air pollutants; (4) with the communities, creating a system for recording and analyzing the sensor data to develop a cumulative impact analysis; (5) preparing a mid-course report (4th month) with community partners to provide an early analysis of what mitigation strategies appear to be supported by the data; and (6) beginning to

implement air pollution exposure mitigation measures with community partners based on initial air sensor and site visit data.

- Phase 2 will take months 7-24 of project (18 months total): (1) collect air sensor and meteorological data in collaboration with community partners; (2) develop the cumulative impact assessment; (3) implement related community education and workforce development; (4) compile 2 incremental analyses (12th and 18th months of overall project) to analyze the data collected and further identify and implement air pollution mitigation and policy needs in partnership with the communities; and (5) from months 18-24, wrap up the data analyses & final report with community input, and plan Phase 3 with the community partners (sensor upgrades and expanded community partnerships) with future funding.

Phase 1 Activities

1. **Steering Committee Set-Up & Community Partnerships:** Establishment of the Steering Committee began during the grant proposal development, and it will continue during the grant project. The Steering Committee will start meeting, including helping to ensure community representatives can attend. The community representatives will lead the development of the Steering Committee's plans for community outreach meetings, workshops, training sessions, and workforce development. Also, these community meetings, workshops, etc. will be initiated.
2. **Air Sensors & Pollutants:** UMD and the technical advisors will present options to the community partnership Steering Committee for the selection of the air sensors and their locations. Monitor selection and site location will be finalized. UMD will lead the air sensor deployment with the community scientists & partners in 3 communities (see cover page).
    - For the project's duration, the selected set of air sensors will build on Maryland's federal reference method (FRM) and federal equivalent method (FEM) ambient air monitoring network. They will also build on the PurpleAir $PM_{2.5}$ sensor networks & community partnerships in areas such as Baltimore City, Cheverly, & St. Mary's County, MD.
    - The air sensor data analyses will consider the types of air pollution sources that contribute to disproportionate cumulative health impacts for communities: incinerators, asphalt and recycling plants, waste oil processing, electricity generation, vehicles, transportation depots, construction equipment & sites, locomotive repair yards, and warehouses.
    - The air sensor data along with community input will be used to identify specific sources or source categories that contribute to inequitable exposures and to identify and implement air pollution reduction strategies. Examples include projects to reduce emissions from diesel vehicles and fugitive dust & conduct targeted stationary source inspections & enforcement.
    - The air sensors will be deployed at 1 supersite in each of the 3 communities and 1 comparison site with help from the communities and with consideration given to Wi-Fi or other Web access in communities with fewer resources.

Phase 2 Activities

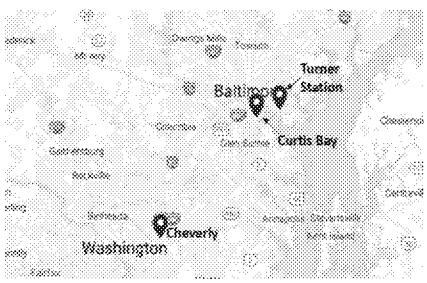
1. **Cumulative Impacts Analysis:** With community scientists, UMD will collect & analyze data from the air sensors to evaluate the communities' cumulative air pollution exposures. The community partnership Steering Committee will review the findings and plan the next steps.
2. **Site Visits/Inspections:** MDE and community scientists will collect data, such as through site visits, to link specific source sectors to air pollution exposures.
3. **Air Pollution Mitigation Measures:** The Steering Committee, led by the community representatives, will recommend to MDE the actions to take based on the data analysis findings. MDE, in conjunction with community education and community scientists, will identify and

start to implement appropriate emission reduction strategies, such as reductions in fugitive dust, targeted source enforcement efforts, and the cleanup of diesel vehicles.

4. **Next Steps:** The Steering Committee will summarize findings and next steps in a written report to share with the communities and other stakeholders. The report will include recommendations for consideration in a future funded phase of this project: improvements needed for the air sensors; expansion of the effort into more Maryland communities; expansion of outreach and partnerships with communities; and enhancements to air pollution reduction policies implemented here and additional policies to reduce inequities in air pollution exposures.

B. Project Significance (10 possible points)

Although Maryland's air quality has significantly improved over the past 30 years, local air pollution persists. The disproportionate public health impacts to EJ communities resulting from exposures to O_3, PM, and other criteria and hazardous air pollutants can be significant. Related illnesses, such as asthma and myocardial infarction, affect the health, well-being, and prosperity of communities. According to census tract-level EPA EJSCREEN 2.0 and MD EJSCREEN analyses, Curtis Bay and Turner Station are in the 95-100th percentile in Maryland for asthma emergency room discharges and hazardous waste proximity. Also, Turner Station reported having myocardial infarction discharges in the 95th percentile. Cheverly is saturated with factories and industrial sites; it ranks in the 89th percentile for hazardous waste proximity. MDE's intensive targeted inspection initiative in the Cheverly area from June 1 – July 30, 2021 found $PM_{2.5}$ hotspots near the town's southwest industrial zone. These statistics are particularly of concern for disproportionate air pollution exposures in these 3 and similarly underserved communities with proximity to heavily traveled roads and major local and stationary sources.



This project will address these and other public health issues by measuring air pollution exposures. The proxy for measuring health exposures will be the air pollution concentrations measured by the sensors. In this project, the community partners will provide input and leadership with the other Steering Committee members to deploy a community-based network of air pollution sensors. Data from the sensors will be used to empower the communities and other Steering Committee partners to examine impacts and to advocate for stronger public health protections. The benefits will be reduced air pollution in EJ communities & improved local issues, e.g., truck traffic routes and street sweeping.

Three EJ communities have agreed to participate as advisors in this project, and one or more of them may be supplied with air sensor bundles: Cheverly, Curtis Bay, and Turner Station. These 3 are representative of EJ communities in Maryland and share many EJ concerns: proximity to highways, railways, electricity generators, and other sources. Also, areas of the communities experience lower employment rates, fewer years of formal education, historical segregation, and structural racism.

Cheverly: This town is in PG County, Maryland in the suburbs of Washington, DC. Surrounded by Interstate 295, U.S. Route 50, Maryland 201, and Maryland 202, sources of air pollution include car and truck (diesel) emissions from highways, light industrial operations, idling vehicles, warehouses and transportation depots with truck traffic, and stationary sources.

Curtis Bay: This residential, commercial, and industrial neighborhood in the southwest section of Baltimore City, since 1897, has been home to the U.S. Coast Guard Yard. The community is surrounded by major industrial air pollution sources, including a coal handling pier, the country's

largest medical waste incinerator, chemical plants, gasoline and alternative fuel storage facilities and a wastewater treatment plant. Coal dust and vehicular dust have been long-standing issues.

Turner Station: The Turner Station area is a historically African American neighborhood in Dundalk. The Dundalk-Patapsco Neck Historical Society notes that Turner's Station was developed in the 1880s by John Turner around the time the Pittsburgh Steel Company built the former steel plant in the Sparrows Point area. Long-term residents of Turner Station have been subjected for decades to high levels of emissions from diesel trucks and cargo handling equipment serving the port, commercial marine vessel traffic, and significant smokestack and fugitive emissions from industrial operations and the former steel plant.

Section 2 – Community Involvement (25 total possible points)

A. Community Partnerships (15 points)

A partnership of community representatives and research institutions will lead and carry out this project, overseen by the Community Partnership Steering Committee composed of their representatives. Technical experts, including the universities, non-profit organizations, and State agencies will provide advice and recommendations to the Steering Committee based on the data reviewed and analyzed. The EJ communities will drive the project in all aspects.

Project Partners	Planned Roles & Resources Brought	Whether/what their Related Expertise Is	Benefits to Participation
(1) Maryland Department of the Environment	Overall project administration and technical support; resources include staff time for site visits and air sensor collaboration	Air monitoring, community engagement, training, technical expertise	Building partnerships and trust with communities to address EJ concerns and "To protect and restore the environment for the health and well-being of all Marylanders."
(2) Green Infrastructure Committee, Town of Cheverly, MD	Steering Committee, for managing the project & possible air sensor host	Community outreach, development, and environmental protection	Supports the community and improves life there
(3) Centro de Apoyo Familiar	Steering Committee for managing the project	Latinx community engagement and support	Partnerships to improve local communities' health
(4) Turner Station Conservation Teams, Inc.	Steering Committee, for managing the project & possible air sensor host	Community engagement and revitalization	Improvement of the community, air quality, EJ, and sustainable quality of life
(5) South Baltimore Community Land Trust	Steering Committee, for managing the project, and possible air sensor host	Community engagement, and neighborhood revitalization	Improved air quality and improved equity for EJ communities
(6) Greater Baybrook Alliance	Steering Committee for managing the project, & possible air sensor host	Community engagement, and neighborhood revitalization	Support to, and improvement of, the communities it serves: Curtis Bay, Brooklyn, & Brooklyn Park
(7) UMD CEEJH	Steering Committee, cumulative impact analysis and community partnerships	Environmental/ public health analyses, policy, and community outreach	Student training, improvement of health, and engagement of the community
(8) UMD, Department of AOSC	Steering Committee, air sensor deployment, data analysis, & pollution sources	Air monitoring, sensors, technical analysis, air chemistry, dispersion	Student training and practical experience; calibration and improvement of air sensors

In addition, the following technical advisors will assist the Steering Committee as needed in their indicated areas of expertise: (1) MDH: technical knowledge on health, air pollution exposure analyses, & local health department work; (2) Chispa/MD League of Conservation Voters: Latinx community and EJ environmental protection; (3) Maryland Latinos Unidos: community EJ and engagement with Latinx communities; (4) North Point Peninsula Council: local traffic and low-income community areas; (5) EIP: air sensors, community partnerships, and environmental policy advocacy expertise; (6) Sierra Club Maryland: environmental community organizing; (7) Environmental Defense Fund, community environmental advocacy; (8) Johns Hopkins University Bloomberg School of Public Health: air quality monitoring and health; and (9) George Washington University Milken Institute School of Public Health: air pollution and health.

How MDE plans to maintain and sustain these relationships into the future:
MDE will continue to build these community and environmental partnerships through ongoing collaborations on projects. This includes ongoing meetings, trainings, and outreach with the communities of Turner Station, Curtis Bay, and Cheverly about varied pollution and climate change issues. Likewise, it constitutes ongoing collaboration with UMD CEEJH and the town of Cheverly for the ongoing PurpleAir PM2.5 air sensor network in Cheverly and enhanced enforcement effort. It includes air pollution research with UMD AOSC. We will also continue to work with the Maryland League of Conservation Voters' Chispa Maryland program on community air monitoring projects.

Partnership letters/letters of commitment for this project from the Steering Committee membership are attached to this application. This includes letters from Turner Station Conservation Teams, Greater Baybrook Alliance, Centro de Apoyo Familiar, and Cheverly Green Infrastructure Committee.

Additional letters of support for this project are also attached to this application from these partner and technical advisory groups: Maryland Latinos Unidos!, Chispa/Maryland League of Conservation Voters, North Point Peninsula Council, Environmental Integrity Project (EIP), Sierra Club Maryland Chapter, and the Environmental Defense Fund.

B. **Community Engagement** (10 possible points)

MDE has productive relationships with all of the project partners. Participation in this project will strengthen and build upon these relationships. Every project partner has expressed strong interest in actively participating on the proposed Steering Committee, which represents broad constituencies. The Steering Committee will include community representatives and community participation on key project implementation decisions such as final equipment selection, final sensor bundles' siting, data review and interpretation, identification of mitigation activities, identification of potential community study locations, reviewing and providing feedback on the final report, and providing insights and recommendations on next steps for future projects.

Recent interactions with Steering Committee partners and proposal supporters include these:
1. Cheverly Green Infrastructure Committee, Town of Cheverly, Maryland - MDE has collaborated with them since 2020 on conducting PurpleAir PM2.5 air sensor monitoring and enhanced air pollution enforcement in Cheverly. The report is on MDE's Web site.
2. Centro de Apoyo Familiar collaborates with MDE and CEEJH on the Maryland Commission on Environmental Justice and Sustainable Communities and works on EJ in PG County, Maryland.
3. Turner Station Conservation Teams, Inc. (TSCT) - MDE's air quality leadership has participated in regular meetings to discuss air quality issues and hear community concerns. TSCT has a strong desire to partner with MDE on air quality projects.
4. South Baltimore Community Land Trust – MDE has been collaborating with SBCLT to address

community concerns following the CSX train explosion in Curtis Bay in Baltimore.

5. Greater Baybrook Alliance - MDE supported GBA's EJ grant development, has met with GBA's Executive Director to discuss air quality issues, and has continued to collaborate with them on pollution problems in the greater Curtis Bay area.
6. UMD, CEEJH has been collaborating with MDE and the Town of Cheverly, Maryland on PurpleAir sensor $PM_{2.5}$ monitoring in Cheverly since 2020. CEEJH has also provided training guides on mobile monitoring and how to use data downloads from the mobile app and Cloud.
7. UMD College Park, AOSC has been assisting MDE in photochemical modeling and observational studies of meteorology, climate emissions, and air pollution in the Baltimore-Washington region for over 25 years. They provide guidance on the calibration sensors, origins of pollutants, and interpretation of air quality data.

MDE's Air Permit regulations also provide for public input for certain construction permit applications. This historically has included many opportunities for MDE-community engagement in EJ areas. For this project, air sensor data and related analyses will be made widely available via the Steering Committee (see page 2) and through the MDE Website and social media pages. Mechanisms to share project milestones and outcomes include: (1) Leverage Steering Committee members' mechanisms such as newsletters, social media groups, community association publications, and Web sites to distribute information; (2) Present at local community associations, and (3) Meet with and present at churches, businesses, schools, and community centers.

The project will focus on using community-science and a participatory research model. This includes partners agreeing upon the terms of collaboration and ensuring equity between partners, including addressing social inequality given existing power imbalances between academics or government agencies and community-based organizations (CBOs). The Steering Committee and CBO partners will play a pivotal role in informing how the partnership operates and how the project is implemented. They will establish MOUs with terms of collaboration, including community co-design and co-generation of the project framework and deliverables. MDE, UMD, and the whole Steering Committee will work throughout the project to ensure constant, consistent, bidirectional and open communication, to build trust. The team will host monthly Steering Committee meetings, and internal communications will ensure community leaders and partners are aware and understand what is occurring with project-related activities. These activities will include regular check-ins; a Google Calendar to ensure that all activities, projects, and events are featured on a yearly calendar that can be electronically accessed; and use of a virtual tool to enhance the ability of project staff and volunteers to collaborate on project objectives via an e-platform.

C. Community-Based Organization Set-Aside (10 possible points) - Not Applicable

Section 3 – Environmental Justice and Underserved Communities (10 total possible points)

The communities of Cheverly, Curtis Bay, and Turner Station will serve on the Steering Committee providing oversight to this project. These 3 EJ communities (also see pgs. 4-5) or communities similar to them, along with one comparison site, will receive air sensors (see page 3), and UMD and the technical advisors will develop the cumulative impact analysis regarding the air pollution exposures. These 3 communities, described below, are representative of the EJ concerns and characteristics of this project. The project will measure air quality in communities such as these and implement air pollution mitigation measures in joint leadership with the EJ communities.

Below is a data chart generated from EPA EJSCREEN, showing the air pollution, demographic, and EJ indicators for which these three communities rank in Maryland's 80th or higher percentile. They have high percentages of people of color, low-income, limited formal education (less than a high school education), higher susceptibility to pollution (population under 5 years), and multiple air

pollution exposures. They rank highly for air pollution-related environmental exposures including National Air Toxics Assessment (NATA) Air Toxics Cancer Risk, NATA Respiratory Hazard Index, NATA Diesel PM, Traffic Proximity, and Risk Management Plan (RMP) Proximity. Within the EJ Index category, including percentages of people of color and low-income, they rank highly for RMP Proximity and Traffic Proximity and Volume.

Area	Category	Selected Variables	Value	State Avg.	State %ile	EPA Region %ile
CurtisBay	Environmental	RMP Proximity (facility count/km distance)	7.4	0.66	99	99
Cheverly	Environmental	Particulate Matter (PM 2.5 in ug/m3)	9	8.43	99	68
Cheverly	Environmental	NATA Air Toxics Cancer Risk (risk per MM)	38	32	98	90-95th
Cheverly	Environmental	NATA Respiratory Hazard Index	0.56	0.44	98	95-100th
CurtisBay	EJ Index	EJ Index for RMP Proximity			97	97
CurtisBay	Demographic	Population under Age 5	14%	6%	96	97
Cheverly	Environmental	NATA Diesel PM (ug/m3)	1.06	0.633	96	95-100th
TurnerStation	Environmental	Ozone (ppb)	46.3	44.6	95	96
CurtisBay	Demographic	Population with Less Than High School Education	27%	10%	94	94
TurnerStation	Demographic	Low Income Population	55%	22%	94	90
Cheverly	Environmental	RMP Proximity (facility count/km distance)	2.9	0.66	94	96
Cheverly	EJ Index	EJ Index for RMP Proximity			92	94
CurtisBay	Environmental	Ozone (ppb)	46	44.6	91	94
TurnerStation	EJ Index	EJ Index for RMP Proximity			90	92
TurnerStation	Demographic	Demographic Index	63%	35%	88	90
CurtisBay	Demographic	Low Income Population	43%	22%	87	80
Cheverly	Environmental	Traffic (daily traffic count/distance to road)	1600	730	87	90
Cheverly	EJ Index	EJ Index for Traffic Proximity and Volume			86	91
Cheverly	Demographic	Population under Age 5	10%	6%	86	88
TurnerStation	Environmental	RMP Proximity (facility count/km distance)	1.4	0.66	85	86
TurnerStation	Demographic	Population with Less Than High School Education	18%	10%	84	82

Section 4 – Environmental Results—Outcomes, Outputs and Performance Measures (20 total possible points)

A. Expected Project Outputs and Outcomes (10 possible points)

Overall, the project includes resources and inputs (see Sec. 2A): staff time and/or in-kind contributions from MDE, UMD, community organizations, and technical advisors. It includes activities (see Sec. 1A): Steering Committee meetings; community outreach; community education and workforce training; data collection and analysis; reporting; and presentations. The audiences include: the 3 EJ communities; academic, governmental, and non-profit group partners. Outputs address the formation of the Steering Committee and its decision-making on the project, the partnerships in this project, the community trainings and workforce development, the deployment of the air sensors, and data collection and analysis. The outcomes include increased knowledge and awareness regarding air quality and EJ communities; mitigation measures, plans, and policies; and long-term reductions in air pollution and health outcomes.

Outputs	Outcomes
• Steering Committee, including EJ community representatives, overseeing and making project decisions	Short-term Outcomes (i.e., a change in knowledge) • Identification and documentation of air pollution exposure risks in EJ communities

• EJ community workforce development and trainings on air quality • EJ communities & academic partners engaged in air sensor deployment and other air pollution data collection and measurement • Air sensor data analyses, air pollution source fingerprinting analyses, and cumulative air pollution exposure analyses • Increased EJ community awareness of air pollution monitoring, air pollution mitigation, & policy changes • Community partnerships established & strengthened • Better data through deployment of air sensor equipment to conduct air quality monitoring in EJ communities	• Increased community awareness of air quality pollution, disparities, and opportunities to mitigate risk • Increased access to information and tools via the cumulative impact assessment to better understand and reduce the environmental and human health risks <u>Intermediate Outcomes (i.e., a change in behavior)</u> • Mitigation measures for communities, state regulators and industry to reduce mobile, area source, and/or stationary air pollution sources' emissions in EJ communities • Community action plan to help mitigate air pollutant(s) • Changes in policies regarding pollution in EJ communities <u>Long-term Outcomes (i.e., a change in conditions)</u> • Reduction of project's air pollutant emissions • Reduction of human exposure to air pollutant emissions

B. Performance Measures and Plan (5 possible points)

Performance Measures: The project managers will track project performance and allow changes to improve program outcomes by the following: establishing the Steering Committee, selecting project communities, selecting monitoring equipment, procuring and siting monitoring equipment, collecting data, analyzing data, and producing the final report. Performance measures will be reviewed during monthly meetings, and where appropriate, reported to EPA in quarterly reports.

Plan: At monthly Steering Committee meetings and at consultations between UMD and MDE, the performance measures will be reviewed in the context of the grant timeline and milestones (see below) and changes made as needed to ensure accomplishment of the program outputs. The partners will track the outputs via the quarterly grant reports to EPA. They will track and monitor the project's progress and evaluate their program results against anticipated outputs and outcomes on a monthly basis. The project will use performance measurements, milestones (see timeline for a summary), and ongoing communication to track, measure and report progress toward expected outputs and outcomes.

C. Timeline and Milestones (5 possible points)

Phase , Tasks and Milestones , Month(s) 1-24

Phase 1: Months 1-6	***Month(s)***
Establish Steering Committee, set up meeting schedule	1
Develop plan for community outreach meetings, workshops, training sessions, and workforce development	1
Select project communities, select monitoring equipment and select monitoring sites	1-3
Procure monitoring equipment	2-4
Conduct community outreach meetings, workshops, and workforce development/ trainings	2-4
Prepare Mid-Phase report w/community partners	4
Deploy equipment and start collecting data in collaboration w/community scientists	4-6
Start to identify & implement preliminary mitigation measures w/community scientists	5-6
Phase 2: Months 7-24	***Month(s)***
Continue data collection w/community scientists	7-13
Prepare 1st Mid-Phase report	14
Conduct data analyses including cumulative impacts with community leaders' input	14-18
Prepare 2nd Mid-Phase report	18
Continue to develop and expand implementation of additional mitigation measures; implement related community education and training	19-22
Produce final report including recommendations for next project phase under future funding and expansion of community partnerships	23-24

The Steering Committee (see p.2) will also meet on a monthly basis and the MDE project lead will meet with the EPA project officer at least quarterly.

Section 5 – Quality Assurance Statement (5 total possible points)

Please see the attachment.

Section 6 – Programmatic Capability and Past Performance (15 total possible points)

A. Past Performance (5 possible points)

The two grants below were managed by a collaboration of counties; a contractor; and MDE's Mobile Sources Control Program, Operational & Administrative Services, & Fiscal Services.

MDE State Clean Diesel Grant Program (66.040) Grant Number DS-96353001. Under this DERA award, more than 30 drayage trucks were replaced, 2017-2021. The federal DERA funding was supplemented with matching funds from Maryland's portion of the Volkswagen Environmental Mitigation Trust. MDE entered into a contractual agreement with Maryland Environmental Services to administer the drayage truck replacement program for emission-efficient trucks of model year 2012 or later.

MDE State Clean Diesel Grant Program (66.040) Grant Number DS-96367701. A total of 31 new emission-efficient buses were purchased to replace older vehicles. This was accomplished via providing financial assistance to Frederick and Queen Anne's Counties utilizing the DERA funds and a cost share requirement. Funding was also used to assist with the purchase of two electric trams to replace older diesel-powered shuttles at the Maryland Zoo in Baltimore.

UMD Grant Projects: Faculty in UMD's AOSC have successfully completed grants and contracts for EPA, MDE, NASA, NIST, and National Science Foundation resulting in over 180 publications in the reviewed literature and periodic and final reports. An example of a current NIST grant project is, "FLAGG-MD: Flux of Greenhouse Gases in Maryland," led by Dr. Russ Dickerson, 9/1/18 - 5/31/2021, budget $800,000. Dr. Wilson of CEEJH has received funding from EPA, NSF, and others. An example is the MD Department of Natural Resources grant over the past 3 years to build and expand environmental mapping tools such as MD EJSCREEN and MD Park Equity mapper.

B. Reporting Requirements (5 possible points)

MDE: For both MDE grants, all quarterly reports were provided as well as annual Federal Financial Reports. A final report is being generated for the drayage truck replacement program and then the grant will be closed out. A final report will be completed for the school bus replacement program within 30 days of its completion but no later than 10/30/2022. **UMD:** AOSC: Quarterly update meetings have been held. Final technical reports have been submitted to and approved by NIST annually, including a summary of observations; publications; presentations at local, national, and international meetings; and a list of M.S. and PH.D. students supported. UMD's Office of Research Administration submits the Federal Financial Reports. CEEJH: Quarterly and semi-annual reports were submitted to and approved by DNR annually. Update meetings are held weekly or biweekly and they include discussions of what data and layers to include within the tools, implementation of new analysis functions, the general layout of the tools, and promotion of user friendliness.

C. Staff Expertise (5 possible points)

The **MDE Ambient** Air Monitoring Program operates an ambient air monitoring network that meets EPA's Clean Air Act requirements for measuring ground-level concentrations of criteria pollutants and air toxics. In operating the network, staff conduct quality control, quality assurance,

and analysis of the pollutant concentrations that are measured at each of the air monitoring stations in our network. The staff involved in these activities have decades of experience in siting and operating monitors and evaluating collected data. Also, MDE's Air Monitoring program has collaborated with universities and other government agencies, using low-cost sensors in areas with heavy pollution source burdens. MDE has an ongoing project with UMD involving the use of a hyper-local network of PurpleAir sensors in Cheverly, Prince George's County. Extensive collaboration between UMD and MDE also has led to improved understanding of the origins, transport, local peak concentrations, and mitigation of air pollution. MDE is assisting St. Mary's County in their deployment of PurpleAir sensors to assess local pollution levels.

MDE's Air Quality Compliance and Mobile Sources Control Program staff also have years of experience, such as in Cheverly, MD, where they investigated and enforced requirements for stationary sources and excessive motor vehicle idling at transportation depots, locomotive repair yards, warehouse operations and construction sites. Also, MDE's air permitting staff is experienced in evaluating pollution reduction measures at stationary sources and negotiating with them to voluntarily implement those measures.

Section 7 – Budget (20 total possible points)

A. Budget Detail (5 possible points)

Personnel: Five MDE staff under "voluntary cost share" will spend 1-4 hours per week on administering and providing support to the project, from the steering committee to enforcement work. One MDE staff, 0.05 FTE, will be funded under the grant to help MDE air programs with oversight and support work of the project. Travel includes voluntary cost share for MDE staff's local trips for community outreach, site visits, and regulatory enforcement. All voluntary cost shares will be covered by State funding and/or funds through the Clean Air Fund. Fringe is for the six MDE staff, and Indirect costs based on direct salaries, wages, and fringe benefits under this grant fund. Equipment includes funding to purchase multi-pollutant air sensors for 3 communities, one comparison site, and one for a backup or collocation at an MDE FRM/FEM site. If EPA Region 3 or UMD is able, as has been suggested, to loan MDE sensors for non-methane volatile organic compounds (NMVOC), NO_2, O_3, and/or black carbon, then with the funds saved, MDE will evaluate these options: (1) purchase and fund lab analyses for a bulk aerosol sampler for total systemic particulates and/or HAPs; and (2) a portable gas chromatograph (GC) for measuring speciated VOCs, precursors of O_3 and PM.

The rest of the grant funds are in the Other category, for a subaward to UMD, consistent with 2 CFR Part 200, to implement the project. This includes funding for UMD to deploy the air sensors, analyze the sensor data, create the cumulative impact analysis, conduct community outreach, build community partnerships, & conduct community training. It also includes funds for participant support costs from the partner communities to participate on the Steering Committee and participate in workforce development, and it includes funding for community consultants to assist the steering committee and continue partnership work with the EJ communities.

MDE Grant Budget

Line Item & Itemized Cost	EPA Funding**	Voluntary Cost Share
Personnel Air Director Project Manager 0.02 FTE x 2 years Air Quality Planning Project Staff 0.1 FTE x 2 years Air Quality Permits Project Staff 0.05 FTE x 2 years Ambient Air Monitoring Project Staff 0.05 FTE x 2 years	$7,500	$35,120

Air Quality Compliance Project Staff 0.05 FTE x 2 staff x 2 years		
Fringe Benefits (rate @ 0.49)	$3,675	$17,209
Travel Mileage, Project Mgr: 50 miles/month@ $0.585/mile x 24 months Mileage, Staff: 3 staff x 50 miles/month@ $0.585 x 24 months	$0	$2,808
Equipment - 5 sensors for O_3, NO_2, $PM_{2.5}$, PM_1, PM_{10}, and black carbon, plus additional pollutants @$20,000/multi-pollutant sensors	$100,000	$0
Supplies	$0	$0
Contractual	$0	$0
Other Direct Costs (Subaward)	$384,000	$0
Indirect Charges (rate @ 0.2404)	$2,686	$0
TOTAL FUNDING	$497,861	$55,137
TOTAL PROJECT COST††	**$552,998**	

B. Reasonableness of Costs (10 possible points)

Personnel: $7,500 for one 0.05 FTE MDE Ambient Air Monitoring Program staff to help oversee the grant implementation; and $35,120 in voluntary cost share for 5 MDE staff to oversee and administer the grant and conduct targeted enforcement inspections to reduce emissions contributing to disproportionate air pollution exposures in EJ communities.

Fringe benefits: $3,675 in grant funds and $17,209 in voluntary cost share for the 6 MDE staff to conduct their oversight, administration, and targeted inspection work.

Travel: $2,808 in voluntary cost share for the MDE staff to conduct inspections/enforcement of stationary and mobile sources' regulations and laws & any needed meeting attendances.

Equipment: $100,000 for purchasing the air sensor bundles for monitoring in the 3 communities, one comparison site, and backup sensor/collocated at an MDE monitoring site.

Supplies and Contractual Costs: None.

Other direct costs (subawards, participant support costs): $384,000 for a subaward to UMD for implementation of the project: (1) $70,000 x 2 students/staff x 2 years to deploy & manage the air sensors, analyze results, and conduct community outreach, training, and partnership building with the 3 communities as described in the budget narrative; (2) $84,000 for participant support costs and stipends; and (3) $20,000 for community consultants to help with the Steering Committee, outreach, and partnerships.

Indirect costs: $2,686 in grant funds calculated based on one MDE staff's salary and fringe who's role is to conduct day-to-day project oversight.

Total costs: This includes $497,861 in requested grant funding & $55,137 in voluntary cost share, for a grand total of $552,998 for the project.

C. Expenditure of Awarded Funds (5 possible points)

As a well-established organization, the MDE has internal controls to ensure the management of federal funds through numerous departments. At the program level, monitoring of the objectives and providing progress is structured with regular reporting to EPA. The procurement department ensures State laws are followed in any competitive bid processes and that MOU's with partners meet legal requirements. All invoicing from partners and contractors are verified at the program level, Budget/Operational staff ensure all documentation/requests for payment are accurate and follow the State's processes, and Fiscal follows procedures for the drawdown of funds.

Section 8 – Optional Attachments:

1. Partnership Letter(s) ➔ Please see attached.

2. Resumes/Bios of the Project Manager and Other Key Personnel ➔ Please see attached.

Attachment: Quality Assurance Statement

The objective of this project is to identify and characterize cumulative air pollution disparities in communities with disproportionate air pollution burdens. The plan is to deploy a package of meteorology and air quality sensors capable of measuring criteria and hazardous air pollutants (HAPs) as well as variables that help indicate which air pollution sources in or near that community are adversely affecting those who live there. Discussions with community members will inform where these sensor packages are located.

Prior to placing these sensor packages in each of the communities, all sensors will be collocated at a Maryland Department of the Environment (MDE) regulatory air monitoring site. The sensor packages will be deployed at the MDE site by the University of Maryland (UMD) and MDE personnel who have extensive experience with air quality sensors, both research grade and low-cost. Dr. Russell Dickerson, Professor, UMD Department of Atmospheric and Oceanic Science (AOSC), will be responsible for the quality assurance and quality control (QA/QC) aspects of the project. Prof. Dickerson heads the Regional Atmospheric Measurement Modeling and Prediction Program (RAMMPP). He is a member of the National Aeronautics and Space Administration's (NASA) Ozone Monitoring Instrument (OMI) Science Team, and he collaborates with NASA's Goddard Space Flight Center (GSFC), the National Institute of Standards and Technology (NIST), and the National Oceanic and Atmospheric Administration (NOAA) Air Resources Laboratory (ARL). Dr. Dickerson and his UMD colleagues collaborate closely with NIST for calibration of instruments for air quality and meteorology.

Pollutants that Dr. Dickerson and his colleagues have measured and/or monitored include particulate matter (PM) optical properties (scattering and absorption), HAPs' aerosol composition (including lead, cadmium, and arsenic), as well as black carbon, NOx (cavity enhanced and chemiluminescence), and CO_2 (cavity ringdown and NDIR). For some examples of their work, see doi:10.1016/j.atmosenv.2019.116873; doi:10.1063/1.3244090; doi:10.1029/2009JD013639; and https://www2.atmos.umd.edu/~russ/recent_pubs.html.

The sensor packages will be operated at the same time as the reference or equivalent monitors (FRM/FEM) under real-world conditions for a few weeks before and after field deployment. These evaluation periods aligns well with EPA guidance in the "How to Evaluate Low-Cost Sensors by Collocation with Federal Reference Method Monitors" presentation.

The main objective of the evaluation periods is to ensure that the sensors are operational, stable, and collecting pollutant data correctly. During the evaluation periods, UMD will be responsible for visiting the site three times a week to ensure that the sensors are operating correctly and to download the sensor data for comparison to the FRM/FEM monitors. In addition, there will be multiple sensors of the same type and model that will allow the data to be evaluated for accuracy, precision, linearity, specificity, and reliability. All details of evaluations and observations will be logged into a project notebook. The data collected will be reviewed and analyzed utilizing the EPA Macro Analysis Tool (MAT) or similar methodology to determine the following: (1) there are no abnormally high or low values (outliers), (2) the expected patterns are present, (3) there are no interferences, and (4) the sensors do not display a drift or shift in response characteristics. All sensors must operate correctly, since the goal of the project is to compare the

sensors' measurements among the three communities with excess air pollution burdens and to the one comparison site without such burdens. By using the sensor measurements in a relative sense, the project team relies on precision rather than absolute accuracy, and comparison to the NAAQS is not needed to ensure the success of the project.

UMD will deploy all the sensors to all the communities participating in the project. After deployment, UMD will check on the sensors multiple times a week (remotely or in person) to ensure that the sensors are operating correctly and following the sensors' manufacturers' guidance. In addition, UMD will do a weekly data comparison of all the sensors to ensure that they are operating normally and collecting reliable data. Sensor packages will be periodically swapped from the communities with air pollution burdens to the site without air pollution burdens as a means of removing bias. To catch and correct any errors early in the deployment process, all sensor data analysis completed by UMD will be checked on a weekly basis by another project partner. This weekly check will continue for a minimum of four weeks. This will help ensure that any errors early on will be corrected and not be carried through many weeks. All field observations and sensor notes will continue to be recorded in a project notebook. All data collected and analyzed will be presented to MDE and the Steering Committee in an effort to maintain total transparency.

When this project is funded by EPA, Quality Assurance (QA) documentation as required by federal regulation 2 CFR 1500.11 will be prepared, completed, and approved prior to conducting data collection activities.

Curriculum Vitae
Russell R. Dickerson

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Home:

Ex. 6 Personal Privacy (PP)

EDUCATION

The University of Michigan
Ph.D., Chemistry, 1980
Ph.D. Dissertation: *Direct Measurements of O_3 and NO_2 Photolysis Rates in the Atmosphere*

The University of Chicago
A.B. with Special Honors, 1975

EMPLOYMENT

The University of Maryland
Department of Atmos. and Oceanic Science
(Formerly Department of Meteorology)
Chair, 1998–1999; July 2002 – 2007
Professor, July 1994 to present
Associate Professor, July 1987 to June 1994
Assistant Professor, Dec. 1982 to June 1987
Affiliate Professor: Department of Chemistry, Chemical Physics, and the Earth System Science Interdisciplinary Center.

Max Planck Institut für Chemie
Abteilung Luftchemie (Air Chemistry Department)
Postdoctoral Fellow, Aug. 1980 to Dec. 1982
Visiting Fellow, 1997, 2018

National Center for Atmospheric Research
Air Chemistry Division
Postdoctoral Fellow, March 1980 to Aug. 1980
Graduate Research Assistant, Aug. 1977 to March 1980

AWARDS

AMS Special Award – OMI International Science Team, 2021
NASA Group Achievement Awards,
ACT-America Science Team, 2020
OWLETS Science Team, 2019
Pecora Award, Aura OMI Intern. Team USGS 2018
DISCOVER-AQ Science Team, 2015
Mentoring: Student awards for D. Anderson (3), S. Benish (2), H. Daley, D. Goldberg, A. Ring, & G. Mazzuca (2) 2014-2019
AGU Fellow 2009
Regents' Award for Public Service, 2008
AAAS Fellow, 2007
NRC Ranked AOSC #5 in the US graduate programs 2010
UMD Leading Researcher, 1999 to present
UCAR/ASP fellowships, 1977-80
U. Chicago: Argonne Nat. Lab. Fellowship & Varsity Wrestling 1971-75

Selected Peer-Reviewed Publications Web of Science ResearcherID F-2857-2010

Ahn, D. Y., et al. (2020), Fluxes of Atmos. Greenhouse-Gases in Maryland (FLAGG-MD): Emissions of CO_2 Baltimore, MD-Washington, DC Area, *J. Geophys. Res. 125*(9).

Ball, W. P., et al., Bulk and size-segregated aerosol composition observed during INDOEX 1999: Overview of meteorology and continental impacts, JGR.

Brent, L. C., et al., (2014), Method for Characterization of Low Molecular Weight Organic Acids in Atmospheric Aerosols Using Ion Chromatography Mass Spectrometry, *Anal. Chem.*

Chen, L. W. A., et al., (2002), Origins of fine aerosol mass in the Baltimore-Washington corridor: Implications from observation, factor analysis, and ensemble air parcel back trajectories, *Atmos. Environ.*

Coggon, M.M., et al. (2021), The human forest: Volatile chemical products enhance urban ozone, *PNAS*.

Dickerson, R. R., et al.,(2019), On the use of data from commercial NOx analyzers for air pollution studies, *Atmos. Environ.*

Dickerson, R. R., S. Kondragunta, et al. (1997), The impact of aerosols on solar ultraviolet radiation and photochemical smog, *Science*, *278*(5339), 827-830.

Goldberg, D. L., et al. (2014), Higher surface ozone concentrations over the Chesapeake Bay than over the adjacent land: Observations and models from the DISCOVER-AQ, *Atmos. Environ.*

Grimes, C. D., J. M. Coney, and R. R. Dickerson (2020), Evaluation of Thermal Optical Analysis (TOA) using an aqueous binary mixture *Atmos. Environ.*

Grimes, C. D., R. Dickerson, (2021) Evaluation of a filter-based black carbon (BC) instrument, *AMT.*

Hall, D. L., (2020), Using near-road observations of CO, NOy, and CO_2 to investigate emissions from vehicles: Evidence for an impact of ambient temperature and specific humidity, *Atmos. Environ.*.

Hembeck, L., et al. (2019), Measured and Modelled Ozone Photochemical Production in the Baltimore-Washington Airshed, *Atmos. Environ. X.*

Li, C. et al., (2010) Concentrations and origins of atmospheric lead and other trace species at a rural site in northern China, *JGR.*

Lopez-Coto, I., et al. (2020), Wintertime CO_2, CH_4, & CO Emissions Estimation for the Washington, DC-Baltimore Metropolitan Area Using an Inverse Modeling Technique, *Environ. Sci. & Tech.*

Martin, C. R., et al. (2017), Evaluation and environmental correction of ambient CO_2 measurements from a low-cost NDIR sensor, *Atmos. Meas. Tech.*

Mazzuca, G. M., (2019), Impact of bay breeze and thunderstorm circulations on surface ozone at a site along the Chesapeake Bay 2011-2016, *Atmos. Environ.*

Northcross, A. L., et al. (2020), Neighborhood Concentrations of PM2.5 and BC, *Environ. Justice.*

Salmon, O. E., et al. (2018), Top-Down Estimates of NOx and CO Emissions...., *J. Geophys. Res.*

Zangmeister, C. D., et al., (2019), A black carbon aerosol mimic...., *Aerosol Sci. Technol.*

Synergistic Activities: Served as advisor to >30 Ph.D. graduates. Director of the Regional Atmos. Measurement, Modeling, and Prediction Program (RAMMPP) for the State of Maryland, MDE and Flux of Atmos. Greenhouse Gases in Maryland (FLAGG-MD) funded by NIST.
Member of the Maryland Commission on Climate Change. LISTOS, PI.

National and International Boards and Committees:
NRC (National Research Council) Committee on Animal Feeding Operations, 2002.
iCACGP representative for USA 2010- 2019.
NASA AURA Science Team 2010- 2019

Current Students: Heather Arkinson, Hannah Daley, Dolly Hall, Sandra Roberts, S. Sahu, Phil Stratton.

Previous Ph.D. Students: D. Ahn, D. C. Anderson, S. E. Benish, B. J. Bloomer, L. C. Brent, P. A. Bueno, J. Burkert, P. Castellanos, A. LungWen Chen, YuJin Choi, K. L. Civerolo, Alex DeCaria, N. Fedkin, D. Goldberg, Courtney D. Grimes, J. C. Hains, K. Hallock-Waters, E. Hughes, S. Kondragunta, R. Levy, Can Li, W. T. Luke, R. Morales-Morales, Gina Mazzuca, L. Nunnermacker, Scot Ozog, Rokjin Park, K. E. Pickering, O. Poulida, A. Prados, K. P. Rhoads, Z. Chaudhry, William Swartz, Brett F. Taubman, David Giles, Hao He, Elena (Deviatova) Yegorova, John Yorks.